CONTRIBUTION, EXPLOITATION, AND MIGRATORY TIMING OF ANNUAL RUNS OF SOCKEYE SALMON STOCKS TO LYNN CANAL IN 1987 BASED ON ANALYSIS OF SCALE PATTERNS

REGIONAL INFORMATION REPORT NO 1J89-18

Alaska Department of Fish and Game
Division of Commercial Fisheries
Juneau, Alaska

December 1989

CONTRIBUTION, EXPLOITATION, AND MIGRATORY TIMING OF ANNUAL RUNS OF SOCKEYE SALMON STOCKS TO LYNN CANAL IN 1987 BASED ON ANALYSIS OF SCALE PATTERNS

By

Scott A. McPherson

Regional Information Report No.[1] 1J89-18

Alaska Department of Fish and Game
Division of Commercial Fisheries
Juneau, Alaska

December 1989

[1] The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Division of Commercial Fisheries.

AUTHORS

Scott A. McPherson is a Region I Fishery Biologist in charge of Lynn Canal sockeye salmon run reconstruction for the Alaska Department of Fish and Game, Division of Commercial Fisheries, P.O. Box 20, Douglas, AK 99824.

ACKNOWLEDGMENTS

Catch data were collected by Dennis Muchmore, Keith Pahlke, Karen Smith, Demarie Wood, Andy McGregor, Gary Lebowitz, and Iris Frank. Fred Bergander and the weir crews of Patty Hambrook-Faverty and Jan Highfield at Chilkoot Lake and David Dreyer and Nick Cassara at Chilkat Lake provided the daily counts and biological data from the 2 weirs. Ray Staska and Kip Kermoin collected the site specific data from the commercial fishery. Bob Syre of Excursion Inlet Processors provided logistic support for catch samplers. Renate Riffe digitized the escapement scales and summarized a portion of that data. Fritz Kraus set up the blind tests. Jan Weller and Mark Olsen assisted in table and figure preparation. Larry Talley wrote the FORTRAN programs for scale digitizing and catch stock proportion correction. Bob Conrad wrote the FORTRAN programs for summarizing the digitized scale data. Fred Bergander and Glen Oliver provided critical review.

PROJECT SPONSORSHIP

This investigation was financed by the Anadromous Fish Conservation Act (P.L. 89-304 as amended) under Award NA-87-ABD-00301.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF APPENDICES (Continued)

LIST OF APPENDICES (Continued)

ABSTRACT

Visual interpretation of scale circuli patterns from three sockeye salmon escapements provided the basis for estimating commercial catch contributions in the Southeast Alaska commercial gill net fishery in District 115 (Lynn Canal). Circuli patterns in the freshwater growth zone provided the principal discriminatory characteristics. Chilkat Lake exhibited the largest freshwater growth zone, Chilkoot Lake the smallest, and the stock to Berners Bay and the mainstem of the Chilkat River, a zone intermediate in size. The minimum estimate of total run of sockeye salmon to Lynn Canal in 1987 was 559,593 fish, of which 415,815 (74%) were harvested and 143,778 escaped to spawn. The Chilkat Lake run contributed 118,662 fish of which 70,069 (59%) were harvested and 48,593 escaped to spawn. Chilkoot Lake contributed 430,180 fish, of which 334,995 (78%) were harvested and 95,185 escaped to spawn. The Berners Bay/Chilkat Mainstem stock contribution included a harvest of 10,751 fish in District 115; these stocks were not enumerated for total escapement. Exploitation rates within freshwater age generally increased with ocean age and longer fish were exploited at a greater rate for both Chilkoot Lake and Chilkat Lake stocks. Mean length of Chilkat Lake fish was greater than fish from Chilkoot Lake of the same sex and age. The mean date of harvest of the three runs was dissimilar; 6 July for Berners Bay/Chilkat Mainstem, 31 July for Chilkoot Lake, and 5 August for Chilkat Lake. The mean date of escapement was 29 July for the Chilkoot run and 29 August for Chilkat. Historical age composition data revealed that Chilkoot Lake was comprised principally of age-1. fish and Chilkoot Lake principally age-2. fish. Chilkoot Lake produced more fish per spawner than Chilkat Lake.

KEY WORDS: Sockeye salmon, scale pattern analysis, stock contributions, Chilkoot Lake, Chilkat Lake, Lynn Canal, total run, escapement, exploitation rate, mean length, brood year returns.

INTRODUCTION

The population of sockeye salmon (*Oncorhynchus nerka*) which returns to Lynn Canal (District 115) each year is presently the largest that spawns in Southeast Alaska. Over the last five years, 1982-1986, catches in Lynn Canal have accounted for an average of 21% of the total sockeye salmon catch in Southeast Alaska (including set net catches in the Yakutat area; ADF&G 1989). During that same period Lynn Canal catches represented 44% of the drift gill net catch in the Region. With such a valuable resource, it is imperative to have an information system that would allow a maximum harvest while providing an optimum level of escapement. The Lynn Canal sockeye salmon population is managed by the Alaska Department of Fish and Game (ADF&G) using an intensive approach with a detailed information system. That information system relies on analysis of scale samples collected from the fishery and from the spawning populations (stocks) that contribute to the catch in the fishery.

The Lynn Canal (District 115) drift gill net fishery operated in the waters of Southeastern Alaska north of Little Island (Figure 1). While all five species of eastern Pacific salmon (*Oncorhynchus* sp.) were harvested, the fleet targeted on sockeye salmon from June through early September. Sockeye salmon harvested in Lynn Canal originated primarily from the Chilkoot Lake and Chilkat Lake drainages, but small spawning populations which utilize river habitat were found in several locations along the mainstem of the Chilkat River and along three rivers in Berners Bay: the Lace, the Gilkey, and the Berners.

Stockley (1950) first documented the obvious differences in freshwater scale patterns of adult sockeye salmon from Chilkoot Lake and Chilkat Lake. Bergander (1973) collected scales from the fishery for use in determining system of origin and demonstrated in 1974 the feasibility of identifying fish from the respective lakes using circuli counts and size of the freshwater zone in a dichotomous key. Bergander (1982) used this method for estimating catch contributions for Chilkoot Lake and Chilkat Lake from 1975 through 1980. During the 1981 season the sample design was improved and stock contributions were estimated using linear discriminant function (LDF) analysis to sort linear scale measurements on a mainframe computer (Marshall et al. 1982). During the 1981 and the 1982 season (McPherson et al. 1983) measurements from age-1.3 fish in the catch were classified to estimate stock contributions for that age class. The ratio of age-1.3 fish to other age classes in each lake's escapement was used to estimate the catch contributions of other age classes. McPherson and Marshall (1986) demonstrated, using the 1983 data, that visual classification of scale patterns could be used to classify all age classes of Chilkoot Lake and Chilkat Lake fish with high levels of classification accuracy. The classification of all catch scales enabled calculation of a variance estimate around the entire stock contribution. McPherson (1987) added a third stock, composed of the Berners Bay and Chilkat Mainstem fish mentioned above, to the visual classification technique to analyze the 1985 and 1986 (McPherson and Jones 1987) data.

Estimation of the numbers of fish harvested by stock is essential to sound management. Catches by stock, coupled with escapement counts, provided estimates of total return by brood year, as well as rates of exploitation. Brood year returns are needed to evaluate optimum escapement requirements and to forecast interannual returns. Exploitation rates by stock and age class

provide managers with additional information by which to adjust time and area openings in order to achieve desired escapements. The temporal distribution of catches by stock and age is essential for calculating cumulative migratory time densities (Mundy 1979) which, when integrated with average timing data and historical cumulative time densities, forms the basis for intra-season abundance forecasting.

The purposes of this report are: (1) document the accuracy of visually classifying the three sockeye salmon stocks (Chilkoot Lake, Chilkat Lake, and a combination of Berners Bay and Chilkat River mainstem) in the Lynn Canal fishery; (2) present the catch, escapement, total run, and exploitation rates of each stock by age; (3) provide average length and migratory timing data; and (4) present brood year tables and historical catches and escapements.

METHODS

Numbers of Fish

Commercial catch data for District 115 was compiled from individual receipts given to fishermen by buyers at the time of delivery. Catch statistics used were those available on 15 March 1988. Subsequent catch tabulations may differ slightly from those presented as errors are detected and corrected. Catches were reported by fishing period and assigned to a statistical week. A statistical week, used to report catch figures in Alaska, begins at 00:01 AM each Sunday and ends the following Saturday at midnight. Weeks are numbered sequentially beginning with the first week in January.

ADF&G weir crews count escapements into Chilkoot Lake and Chilkat Lake (Figure 1). The Chilkoot River Weir, located approximately 0.8 kilometers upstream of the river mouth, was operated from 4 June through 18 October. Chilkat Lake Weir, located at the lake's outlet approximately 35 kilometers upstream from the mouth of Chilkat River, was operated from 18 June through 20 November.

Age, Sex, and Length

Commercial catches and escapements at the two weirs were sampled throughout the season for scale, sex, and length data. ADF&G employees collected sockeye salmon scale samples from vessel and tender landings in the ports of Excursion Inlet, Sitka, Petersburg, Juneau, Pelican, and Hoonah in approximate proportion to the number of sockeye salmon delivered. The weekly catch sampling goal was 1000 scales, designed to collect sufficient samples to estimate the proportion of each age class of the most abundant stock to within 5 percentage points 90% of the time using standard binomial equations in Cochran (1977). The precision of age composition estimates for the less abundant stocks will be less. The weekly goal was generally obtained during each week of the season except after August 30 when catches were low. Catches after 26 September represented less than 1% of the season total and were not sampled. The age composition observed for the 13 to 26 September period was used to represent the age composition of those catches. Dipnets were used to capture

fish as they passed through the Chilkoot Lake weir, while beach seining and traps were used at the Chilkat Lake weir site. The escapement sampling goal at the weirs was to collect sufficient samples to estimate the proportion of each age biweekly to within 5 percentage points 90% of the time. Samples were taken from the spawning grounds on the Lace River (Berners Bay) and along the mainstem of the Chilkat River in locations where sockeye salmon were concentrated in clear tributaries. These samples were time and area limited and may not be representative of the entire Berners Bay/Chilkat Mainstem population.

Scales were obtained from the either side of the fish as shown in Mosher (et al. 1961). The 'preferred scale' is in the second scale row above the lateral line in the diagonal scale row downward from the posterior edge of the dorsal fin to the anterior edge of the anal fin. Scales were mounted on gummed cards and impressions made in cellulose acetate (Clutter and Whitesel 1956). Age was determined by visual examination of scale impressions magnified 70x on a microfiche reader; criteria used to determine age generally followed those of Mosher (1968). Length frequency analysis was used to determine ages on scales from escapement collections that exhibited a high degree of resorption of the marine growth zone. Ages were reported in European notation. Length was measured from mid-eye to fork-of-tail to the nearest 5 millimeters. Sex was determined by examination of external dimorphic sexual maturation characteristics, including kipe development, belly shape, trunk depth, and jaw shape. Sex determination in the catch was most often made by two samplers and where disagreement occurred, sex was verified by inspecting gonads through a small incision in the belly. An experiment to determine accuracy of sex determination was implemented during the 1987 season. Examination and verification of 1,623 sockeye salmon from the commercial fishery in Lynn Canal by five samplers resulted in an overall accuracy of 94.5% (K. Pahlke, ADF&G, Division of Commercial Fisheries, Douglas, unpublished memorandum, 9 March 1988). Accuracy of sexing fish sampled from the escapements is believed to be higher because maturation characteristics are further developed at these locations.

Estimates of the total catch or escapement of each age class were made by applying period-age composition data to the number of fish during those time periods and summing the estimates across time periods. Standard errors in each stratum are calculated by a standard binomial equation using the correction for finite population size:

$$SE_{ij} = \sqrt{\left[\frac{(\hat{P}_{ij})(1 - \hat{P}_{ij})}{\hat{n}_j - 1} \right] * \left[1 - \frac{n_j}{C_j} \right]}$$

where:
- i = age class,
- j = time period,
- P_{ij} = proportion of fish of age i in stratum j,
- n_j = sample size for stratum j, and
- C_j = catch or escapement of fish in stratum j.

The standard error for each age class summed across strata in the total commercial catch in Lynn Canal or the escapements to Chilkoot Lake or Chilkat Lake was calculated by weighting it's standard error for each sample period by the total catch (or escapement) during the sample period as follows:

$$SE_{i.} = \sqrt{\frac{\sum_{j}^{j} [SE_{ij}]^2 * C_j^2}{C_.^2}}$$

Average lengths by age and sex and associated standard errors were calculated for catches and escapements from each run.

Scale Pattern Measurements

Linear scale pattern measurements were recorded into an electonic data base to provide quantitative illustration of the stock differences I recognize in various scale growth zones. In addition, the linear measurements can be combined with the spawner-recruit data base to improve accuracy in forecasting future returns.

Scale images were magnified to 100 power and projected onto a Talos digitizing tablet using equipment similar to that described by Ryan and Christie (1976). Measurements were marked and then recorded electronically using a FORTRAN program modified by L. Talley (ADF&G, Commercial Fisheries Division, Douglas), a process called digitizing. Measurements were made along the anterior-posterior axis of the scale in specific zones dependent on age class (see Figure 2). One zone was measured for each freshwater annulus, the plus growth zone, and the first marine year. Within each zone, the digitizer recorded the linear distance between each circuli. A series of FORTRAN programs written by B. Conrad (ADF&G, Sport Fish Division, Anchorage) was used to transform and summarize the digitized scale characteristics.

Blind Tests

Scale samples collected each week from District 115 were classified to stock of origin. I first determined the age of each fish from the image projected onto a microfiche reader and then assigned it to one of the three stocks based on scale characteristics. The numbers of each stock were summed each week to provide timely estimates of stock contribution for in-season management purposes. Time and area adjustments were made in the fishery based on: (1) in-season forecasts, the comparison of the current year's cumulative catches and escapements of each stock to the historical average, to gauge run strength and (2) most importantly, to achieve the escapement goals of 60,000-80,000 for Chilkoot Lake and 70,000-90,000 for Chilkat Lake.

Catch statistics were updated and the estimated stock proportions were corrected for misclassification as part of this report in order to add precise and accurate estimates of the current year's data to the historic Lynn Canal sockeye salmon stock identification data base. In order to test the accuracy of the in-season allocation and to correct for misclassification between stocks, a blind testing procedure was used.

A previous study (McPherson and Marshall 1986) indicated that sufficient differences existed in freshwater scale patterns of Chilkat Lake and Chilkoot Lake stocks to identify the origin of catches by visual inspection of scale samples at medium magnification. In 1985 a third stock (fish from Berners Bay and the mainstem of the Chilkat River) was added to the stock classification system because McPherson (1987) saw many scale patterns in catch samples that were not recognizable as those from Chilkoot Lake or Chilkat Lake. Fish from Berners Bay and the Chilkat Mainstem were combined into one stock because scale patterns and age structure from these locations are similar; the freshwater growth zone is intermediate in size compared to Chilkoot and Chilkat Lakes. Also, many of these fish are of age 0.; fish of this age are not present at either Chilkoot Lake or Chilkat Lake. Results of the blind tests for the 1985 and 1986 data revealed that a high degree of classification accuracy was maintained in stock allocation estimates using a 3-stock model, ranging from 93% to 100% across age classes. In 1987 fish from Berners Bay/Chilkat Mainstem were again present in relatively high numbers in early season catches. Escapement scales were collected from these fish to develop a blind testing procedure for three stocks.

A separate test was designed for each individual age class common to two or more stocks. To construct each test, a technician selected scales from each of the three escapements according to numbers specified by a random number list generated by a computer and based, for some tests, on availability of scales. After selection and remounting was completed for each test, I visually classified the scales to stock of origin. The technician compared that classification to the true origin for each scale which defined the accuracy of the method.

Nine blind tests were developed, for fish aged 1.1, 1.2, 1.3, 1.4, 2.2, 2.3, 2.4, 3.2, and 3.3. The tests for fish aged 1.2, 1.3, and 2.3 included escapement scales from all three stock groups; the other tests were comprised only of Chilkoot and Chilkat Lake scales. Fish aged 0. were found only in escapements to Berners Bay/Chilkat Mainstem, and subsequently, a blind test was not needed for these fish.

While size of the freshwater annulus and the number of ciruli in the freshwater growth zones were the principal scale characteristics I used to distinguish between runs, others considered were: (1) the total size of the freshwater growth zone; (2) size of the freshwater plus growth zone; (3) completeness of the freshwater circuli, and (4) the spacing between the circuli in the freshwater growth zone.

Mixed Stock Analysis

The results of the blind tests were used to build a correction matrix to compensate for misclassifications in each age class (see Table 1). The correction matrix is a square matrix with one column and one row for each group. Each row represents the true stock of origin and each column element is the proportion of the scales in each row that were actually classified to each stock using the visual classification procedure. Diagonal elements in the matrix represent correctly classified scales, while off-diagonal elements represent misclassified scales.

The proportional estimates of stock composition from the in-season analysis, referred to as initial estimates, were adjusted by application of a model and its correction matrix (Cook and Lord 1978). A vector containing adjusted proportions, referred to as corrected estimates, was the result. One vector of corrected estimates was calculated for each stock in each age class for every fishing period of the season using a FORTRAN source code written by Larry Talley (ADF&G, Commercial Fisheries Division, Douglas). In cases where corrected proportions for any stock were less than zero, the entire catch sample was reclassified with a model excluding that stock group.

The standard error of the corrected estimates of stock proportions were computed using the procedures of Pella and Robertson (1979). The variance-covariance matrices for the misclassification matrix and for the mixed stock proportion vector were determined from the multinomial probability distribution. These two variance-covariance matrices were combined to give variances and covariances for the corrected estimates of stock proportions. The variances for the proportions of each stock were the diagonal elements of this combined matrix, i.e. they are an additive combination of: (1) the sampling variation in estimation of the probability of assignment of the known stock and (2) the sampling variation in estimation of the assignment of the mixed stock samples.

Catch samples were classified to stock and age class within statistical week, corrected for misclassification, and expanded to the catch size of that week.

The variance of the entire weekly and seasonal allocation to one stock, across the 12 age classes, was estimated with the delta method (Seber 1982) using a source code written by David Bernard (ADF&G, Sport Fish Division, Anchorage) and modified by myself to output weekly variance estimates. The variance estimate is a function of: (1) age composition of the catch, (2) stock proportions within each age class, (3) standard errors of stock proportions due to misclassification (from Pella-Robertson calculation), (4) weekly scale sample size, and (5) catch size. See Appendix C in Oliver (et al. 1985) for a detailed description of this procedure.

Mean Dates of Migration

Migratory timing (abundance as a function of time) was the driving force behind management strategies which regulated time and area openings to selectively harvest the target stock or species. Migratory timing statistics for the harvest of all three stocks and the weired escapements are presented to provide an index of relative timing following methodology of Mundy (1979; 1982).

To calculate mean and variance, the empirical migratory time density is defined to be the time series of daily or weekly proportions, P_t, where:

$$P_t = n_t/N$$

where: n_t = abundance on time interval t and

N = total annual abundance.

For a migration over a time interval of m days or weeks, the mean of t is estimated:

$$\hat{\bar{t}} = \sum_{t=1}^{m} t*P_t$$

and its variance is estimated:

$$\hat{S}_t^2 = \sum_{t=1}^{m} (t - \bar{t})^2 * P_t$$

The central day (mean) of weired escapements is presented as weir counts are stratified by day, whereas in the catches, the central week (mean statistical week) is presented as catches are reported by week. Catch rather than catch-per-unit-of-effort (CPUE) is used as the index of abundance because CPUE does not reflect run timing accurately in Lynn Canal. Effort varies widely in the Lynn Canal drift gill net fishery (much greater mid- and late-season than early in the season), and because the fishery is saturated late in the season with gear, CPUE of sockeye salmon at that time of the year does not reflect the true magnitude of the run(s). Run timing of the catch is influenced in part by management decisions.

RESULTS

Scale Pattern Measurements

Photographs which illustrate typical magnified scale patterns for fish aged 1. (ages 1.1, 1.2, 1.3, and 1.4) and aged 2. (ages 2.1, 2.2, and 2.3) from each of the three stocks are shown in Figures 3 and 4.

Escapement scales were digitized from each of the three stocks in 1987 to illustrate what the scale patterns of the various ages represent in terms of linear distances along the anterior-posterior axis of the scale. Detailed tables of selected variables summarized for each stock and age class plus standard errors and ranges are presented in Appendices A.1-A.7. The average number of circuli and incremental distances in each zone were summarized by stock and age class in Table 1. Escapement scales were digitized for seven age classes from Chilkat Lake, for four age classes from Chilkoot Lake, and for two age classes from Berners Bay/Chilkat Mainstem. Fish of the missing age classes from Chilkoot Lake and Berners Bay/Chilkat Mainstem were rare or not present.

The number of circuli (NC) and incremental distances (ID in thousandths of an inch) were remarkably consistent within a freshwater age class for the same stock (Table 1). The average NC in the first freshwater year for Chilkat Lake fish aged 1. (ages 1.1, 1.2, and 1.3) ranged from 14.0 to 15.0, and the average ID ranged from 167.7 to 184.0. For Chilkat Lake fish aged 2. (ages 2.1, 2.2, and 2.3), the average NC in the total freshwater zone ranged from 23.6 to 24.6, and the ID ranged from 265.5 to 281.4. The average NC in the first freshwater year for Chilkoot Lake fish aged 1. (ages 1.2 and 1.3) ranged

from 6.2 to 6.6 and for fish aged 2. (ages 2.2 and 2.3) ranged from 4.5 to 4.9. The NC among fish aged 1. from Berners Bay/Chilkat Mainstem ranged from 8.9 (age 1.3) to 9.6 (age 1.2). That these differences are consistent across age classes is important to the integrity of the visual classification technique from year to year.

The differences in NC and ID in the same age class among stocks was large and consistent, especially so for ID values (Table 1). For instance, among fish aged 1.3 the average NC in the first freshwater year for Chilkat Lake, Berners Bay/Chilkat Mainstem, and Chilkoot Lake was 14.0, 8.9, and 6.2, but the average ID was 167.7, 92.4, and 54.4. Since the proportional differences were greater for the ID values, this means that the average distance between circuli was least for Chilkoot Lake (8.8 per circuli), midrange for Berners Bay/Chilkat Mainstem (10.4), and greatest for Chilkat Lake (12.0). The difference in average circuli ID can be seen in the scale photographs in Figures 3 and 4. Similar differences in NC and ID were apparent among fish aged 1.2 for all three stocks. Differences between fish aged 2. for Chilkat and Chilkoot Lakes were greatest in the second freshwater year. The NC values for Chilkoot Lake in this zone were less than half those for Chilkat Lake and the ID values were one-third or less.

Frequency distributions of the NC and ID values for individual fish are graphed in Appendices A.8-A.17 for selected scale variables for fish aged 1.2, 1.3, 2.2, and 2.3. ID values for age-1.2 fish in the first freshwater year show that no overlap was present between Chilkat Lake and the other two stocks and that some, but relatively little, overlap existed between Chilkoot Lake and Berners Bay/Chilkat Mainstem (Appendix A.8). The same differences were present for the ID values in the total freshwater zone, however, the overlap between Chilkoot Lake and Berners Bay/Chilkat Mainstem was greater because the size of the plus growth zone for Chilkoot Lake was larger. Among fish aged 1.3, overlap existed between all three stocks for NC values in the first freshwater year, but the overlap was minimized by looking at the ID values for the total freshwater zone (Appendices A.10 and A.11). ID values for fish aged 2.2 reveal that the first freshwater year for Chilkat Lake was quite variable and even overlaped with fish from Chilkoot Lake (Appendix A.12). However, the size of the second freshwater year and total freshwater zone was less variable for Chilkat Lake fish aged 2.2 and no overlap existed with Chilkoot Lake (Appendices A.13 and A.14). The same trends were evident for fish aged 2.3 as for age-2.2 fish from Chilkoot and Chilkat Lakes except that the differences were even greater (Appendices A.15-A.17). A review of the above differences shows why it is not difficult to use a visual classification system for classifying sockeye salmon scales from Lynn Canal catches to stock of origin.

Blind Tests

Results of the nine blind tests used for determining the accuracy of visual classification of fish from the Chilkoot, Chilkat, and Berners Bay/Chilkat Mainstem systems are summarized in Table 2. Overall accuracy was high in all tests and ranged from 97.0% to 100 percent. Among age-1.3 fish, the most abundant single age class in the fishery, overall classification accuracy was 97.0 percent. Some (5%) of the Chilkoot Lake and some (2%) of the Chilkat Lake fish classified to Berners/Mainstem, but only 1% of the Berners/Mainstem classified to each of the other two stocks. This misclassification trend

meant that the initial estimates for Berners/Mainstem in this age class were higher than the corrected estimates.

The corrected post-season stock proportions are compared to the in-season estimates in Table 3. The corrected proportions were similar to the initial estimates. Season differences ranged from 0.003 for Chilkat Lake to 0.015 for Berners Bay/Chilkat Mainstem and 0.019 for Chilkoot Lake.

Harvest

Annual harvests in Lynn Canal (District 115) ranged between 18,388 and 369,311 sockeye salmon from 1960 to 1986, with an average annual harvest of 138,308 fish (ADF&G 1989). Annual harvests during the most recent five years (1982 - 1986) averaged 314,262 fish. The 1987 harvest of 415,815 was the highest annual harvest on record. The catch of 101,627 fish during statistical week 32 (2-8 August) in 1987 was the highest weekly catch ever recorded in the district.

The 1987 harvest of sockeye salmon in Lynn Canal occurred over a 17-week period (Table 4). Management strategies to selectively harvest or protect stocks of sockeye (*O. nerka*), chinook (*O. tshawytscha*), coho (*O. kisutch*), pink (*O. gorbuscha*), or chum (*O. keta*) salmon resulted in considerable variation in the time and areas open to fishing each week.

Fish aged 1.3 dominated the catch (61.4%) followed by fish aged 2.3 (26.6%), 2.2 (5.1%), 1.2 (5.0%), and 0.3 (1.5%). Fish of all other age classes accounted for less than 1% of the catch (see Appendix B.1). Temporal trends in age composition of the catch were evident (Figure 5). The percentage of fish aged 1.3 decreased through the season while those aged 2.3 and 2.2 increased.

The harvest of 415,815 sockeye salmon was estimated to be comprised of 334,995 (80.6%) Chilkoot Lake fish, 70,069 (16.9%) Chilkat Lake fish, and 10,751 fish from Berners Bay/Chilkat Mainstem (Table 5; Appendix B.2).

The harvest of Chilkoot Lake fish was primarily fish aged 1.3 (68.0%), 2.3 (25.2%), and 1.2 (5.8%) (Appendix B.3). The percentage of fish aged 2.3 was the highest recorded in the harvest of Chilkoot Lake fish for the years 1981-1987. The relative abundance of fish age 1.3 and 2.3 changed significantly ($P < 0.001$) through the season (Figure 6A). The proportion of fish age 1.3 decreased while those aged 2.3 increased, a trend not observed for any year 1981-1986.

The catch of Chilkat Lake fish was split between three age classes (2.3, 1.3, and 2.2) which accounted for 37.2%, 33.9%, and 26.9% of the catch, (Appendix B.4). Early in the run, age-1.3 fish dominated catches and accounted for 65.1% to 83.1% of the harvest (Figure 6B). The percent of fish aged 1.3 dropped to 47.3% of the catch during week 31 (26 July-1 August) and continued to decrease steadily to approximately 2% of harvest in the last four sampling periods. The relative abundance of fish aged 2.3 and 2.2 increased as the season progressed, accounting for the majority of the catch after 26 July.

The harvest of Berners Bay/Chilkat Mainstem was comprised principally of two age classes: 0.3 (56.2%) and 1.3 (36.0%) (Appendix B.5).

Scales collected from specific sites in the commercial fishery were collected to gauge migration patterns for in-season management purposes. The stock composition of these samples is presented in Appendix B.9 to ensure their summarization.

Escapement

Annual escapements for the period 1976 to 1986 averaged 83,655 sockeye salmon to Chilkoot Lake and 77,216 to Chilkat Lake. The escapement in 1987 of 95,185 fish to Chilkoot Lake was 14% above average, while that to Chilkat Lake (48,593 fish) was 37% below average. Escapements to Chilkoot Lake in the parent years of 1981 and 1982 were 83,372 and 102,973, respectively, while those to Chilkat Lake in the same years were 84,089 and 80,221. The escapement goals are 60,000-80,000 for Chilkoot Lake and 70,000-90,000 for Chilkat Lake.

The estimated escapement into Chilkat Lake was 48,593 sockeye salmon. The weir was operated from 18 June through 20 November (Appendix C.1). More than 53% of the escapement past the weir occurred after 1 September (Figure 7). The escapement was characterized by three separate periods of escapement counts which occurred during: the last 3 weeks of July, the last 3 weeks of August, and the last 2 weeks of September. Between these periods, the weir counts were extremely low due to actual flow reversal of the Chilkat Lake outlet stream where the weir was located. This condition was caused by high runoff of the adjoining Tsirku River which, under normal flow conditions, is only a few feet lower in elevation. During periods of flow reversal, fish migrate downstream and do not migrate upstream again until after normal flow conditions return. Three strong flow reversals occurred in 1987, from 22 July to 4 August, from 4 to 17 September, and from 1 to 18 October.

The estimated escapement into Chilkoot Lake was 95,185 fish. The weir was operated from 4 June through 18 October (see Appendix C.2). The central 50% of the escapement occurred during the period 4 July to 17 August. The escapement was less dispersed than the Chilkat Lake escapement (variance=550 days squared versus 961 days squared). Both escapements were more dispersed than average; the average dispersion for Chilkoot Lake was 431 days squared during the years 1981 - 1987 and that for Chilkat Lake was 577 days squared.

Escapements in the rivers of Berners Bay and at various locations along the Chilkat River mainstem were not enumerated for total counts as were Chilkoot and Chilkat Lake. Instead, surveys were conducted to count the total number of live and dead fish on specific days. Total counts of fish on August 15 in Berners Bay were 614 fish in the Gilkey River, 250 fish in the Berners River, and 1,805 fish in the Lace River. No surveys were conducted in the Chilkat River Mainstem areas in 1987.

The Chilkat Lake escapement, like the catch, was divided between three principal age classes, ages 2.2 (36.0%), 2.3 (32.4%), and 1.3 (24.1%). Six other age classes contributed the remaining 7.5% (Appendix C.3). Period estimates of age composition showed that, as in past years, fish aged 1.3

decreased in relative abundance through the season and those aged 2.2 and 2.3 increased (Figure 8A). Males comprised 55% of the escapement. This preponderance of males was seen across most age classes except in ages 2.2 and 3.2 where females were higher in abundance.

In the Chilkoot Lake escapement, fish aged 1.3 (66.0%) dominated samples, while fish aged 2.3 (23.0%) and 1.2 (8.3%) were common (see Appendix C.4). Trends through time in the age composition of the escapement (Figure 8B) show that fish aged 1.3 decreased significantly ($P<0.001$) in relative abundance, while age-2.3 fish increased as the season progressed. Sex composition data revealed that males were more abundant (56%). This trend was evident across most time periods and age classes. The same dominance of males was observed in the 1985 and 1986 data. This dominance was especially evident among fish aged 1.2 where males were more abundant by a 3.4:1 ratio.

Samples collected from the Lace River in Berners Bay on 15 August indicate that a majority (62.4%) of age-1.3 fish were present (Appendix C.5). Age-0.3 fish were also present in appreciable relative abundance (32.3%). Males were more abundant (68%) than females in these samples.

Limited samples collected from the Chilkat River Mainstem on 14 October were dominated by fish aged 1.3 (74.5%) (Appendix C.6). Males and females were approximately equally abundant.

Exploitation Rates

The total run of sockeye salmon from Chilkoot Lake was 430,180 fish of which 334,995 were caught and 95,185 escaped to spawn (Table 6). The exploitation rate for this run was 78%. The total run of Chilkat Lake sockeye salmon was 118,662 of which 70,069 were harvested and 48,593 escaped to spawn. The exploitation rate for this run was 59%.

Exploitation rates for Chilkoot and Chilkat Lake sockeye salmon tended to increase directly with ocean-age regardless of stock (Table 6). Little exploition was seen among ocean-age-.1 fish. Among ocean-age-.2 fish, 68% of the Chilkoot Lake fish and 51% of the Chilkat fish were caught, while among ocean-age-.3 fish 79% of the Chilkoot Lake fish and 64% of the Chilkat Lake fish were harvested. Ocean-age-.4 fish were rare from both systems.

Size at Age by Sex and Stock

The mean lengths of Chilkat Lake sockeye were greater than those of Chilkoot Lake and Berners Bay/Chilkat Mainstem fish from the same age group and sex in catches and escapements ($P<0.01$) (Table 7). Differences were greatest among age-2.2 fish; Chilkat Lake fish were 44 mm longer than Chilkoot Lake fish in catches and 62 mm in escapements.

Chilkoot Lake fish of ocean-age-.3 sampled from catches were slightly smaller than those sampled from escapements (Table 7). Fish aged 1.3 were an average of 7 mm longer in catches while those aged 2.3 were 9 mm longer. A much greater difference was observed among ocean-age-.2 fish. Fish of age-1.2 and

-2.2 were an average of 39 mm and 43 mm shorter in escapements than catches, respectively. Within the catch samples, males were larger in all age classes except among fish aged 1.2 and 2.2. Males were longer in escapement samples in all age classes except among age-2.2 fish.

On the average, Chilkat Lake fish of ocean-age-.3 sampled from escapements were similar in length compared to those sampled from catches (Table 7). Fish of age-2.2, on the other hand, were longer in catch samples by 25 mm. Males in both catches and escapements exhibited longer mean lengths across all age classes except among fish aged 1.2 in the escapement which were 7 mm longer.

The average length data for Berners Bay/Chilkat Mainstem is not adequate to make comparisons between average lengths in catches and escapements as only a portion of the spawning grounds were sampled and may not have been representative of the entire spawning population.

The temporal distribution of the average length of catch samples from each stock by age is presented in Appendices B.6-B.8, and the temporal distribution of the average length of escapement samples from Chilkoot and Chilkat Lakes appears in Appendices C.7 and C.8. No apparent trends in length distribution were found among Chilkoot Lake samples. Chilkat Lake fish aged 1.3 in the catch and age-2.3 fish in both the catch and escapement increased significantly ($P<0.01$) through the season.

Mean Dates of Migration

This section summarizes the mean dates of harvest (MDH) and escapement (MDE) by age and stock group. Significant differences in average migratory timing were evident in both inter- and intra-stock comparisons.

Catch

The MDH of Berners Bay/Chilkat Mainstem fish was earliest (7 July), followed by Chilkoot Lake (31 July), and Chilkat Lake (5 August; Table 8).

In the Chilkoot Lake harvest, fish aged 1.2 and 1.3 exhibited the same MDH (27 July) while that of age-2.3 fish was 2 weeks later (10 August; Table 8). Fish aged 2.3 have not, in the past 4 years, exhibited an MDH signicantly different from other age classes (McPherson and Jones 1987). Approximately 52% of the harvest occurred during 3 weeks (19 July - 8 August). Age-1.3 fish exhibited the most dispersed harvest as indicated by a standard error (SE) of 2.0 weeks, while fish aged 2.3 were the least dispersed (SE=1.5 weeks).

The MDH's for major age classes in the Chilkat Lake harvest indicated similar migratory timing for fish aged 1.2 and 1.3 (22 July) and much later timing for fish aged 2.2 (13 August) and 2.3 (12 August; Table 8). These trends were similar to those observed in earlier years (McPherson and Jones 1987). The central 50% of the run was harvested during the period 19 July to 22 August. The harvest of age 2.3 fish was the most dispersed (SE=2.5 weeks) and that of fish aged 2.2 the least (SE=1.9 weeks).

Most fish from Berners Bay/Chilkat Mainstem were harvested early in the season as was indicated by mean dates of harvest for fish aged 0.3 (8 July) and 1.3 (1 July).

Escapement

The mean dates of escapement (MDE) for Chilkoot Lake and Chilkat Lake exhibited trends relatively similar to those observed in the catch (Table 8). Age-1.3 fish arrived earliest (MDE=20 July) at Chilkoot Lake weir; the MDE for fish aged 1.2 was 5 days later and several weeks later for age-2.3 fish (MDE=13 August). Fish aged 1.3 were again most dispersed, SE=3.2 weeks. At Chilkat Lake weir, fish aged 1.3 exhibited the earliest MDE (27 July), followed by fish aged 1.2 (14 August), 2.3 (9 September), and 2.2 (14 September). Fish aged 2.3 were the most dispersed, SE=3.7 weeks.

Historical Data Base

The accumulation of the stock identification data for Lynn Canal sockeye salmon has resulted in a data base from which we can intensively manage this resource. Cumulative migratory time densities in conjunction with curve fitting techniques are used to forecast the abundance of Chilkoot and Chilkat Lake stocks during the fishing season. Age composition of the catch and escapement of each stock enables us to build return per spawner tables which are in turn used to calculate optimum escapement levels. The spawner-recruit data base, when coupled with length and environmental data, can be used to develop a preseason abundance forecast for each stock. Presented below are some highlights of the historical data base for Lynn Canal sockeye salmon.

The total season catch, escapement, total run, and exploitation by run are presented in Table 9. Escapements for Chilkat Lake and catches in Lynn Canal are shown for 1967-1987. Catches, escapements, total runs, and exploitation rates for Chilkoot and Chilkat Lake are presented for 1976-1987. Catches (see footnotes) are shown for Berners Bay/Chilkat Mainstem for 1976-1987; escapements for this stock were not entirely enumerated and are not presented. Catches for the period have been comprised of a majority (51%) Chilkoot Lake fish and Chilkat Lake contributed most of the rest (46%). Total runs (catch plus escapement) averaged 213,265 fish to Chilkoot Lake and 168,323 to Chilkat Lake. The total run of 430,180 Chilkoot Lake sockeye salmon in 1987 was double the average. Runs to Chilkoot Lake have been larger for 1982-1987 than for 1976-1981, but the same is not true for Chilkat Lake. The total run to Lynn Canal (all stocks combined) has averaged approximately 388,000 and has ranged from 211,462 (1978) to 583,862 (1983) fish. Average exploitation, 1976-1987, of the Lynn Canal total run has been 0.55, but has been higher than that level in all years since 1982.

Chilkoot Lake sockeye salmon have been dominated by a single age class (age 1.3) every year since 1976, averaging 68% of the total annual run (Table 10). Most of the remainder was age-2.3 fish, but age-1.2 fish contributed more than 10% in some years. On average, Chilkoot Lake fish were 78% age-1. fish. Exploitation by age class revealed that two-ocean-age fish (primarily ages 1.2 and 2.2) were exploited at a lesser rate (approximatly 0.46) than three-ocean-age fish (ages 1.3 and 2.3) where average exploitation has been 0.64.

The age composition of Chilkat Lake sockeye salmon was dominated by age-2.2 and age-2.3 fish each year, which, on the average, were 38% and 37% of the run (Table 11). Age-1.3 fish comprise an average of 21% of the run. The Chilkat Lake run was comprised of an average of 75% age-2. fish in direct contrast to the Chilkoot Lake run (78% age 1.). Exploitation of the Chilkat run has averaged 55% compared to 62% for Chilkoot Lake. Exploitation by age for the Chilkat Lake fish indicates that two-ocean-age (age-.2) fish were exploited less than age-.3 fish, but the difference was less than that seen among Chilkoot Lake fish. This happened because age-.2 Chilkoot Lake fish were smaller than the age-.2 Chilkat Lake fish (see Table 7) and selectivity by the gill nets used in the fishery is greater for smaller fish.

Brood year returns for Chilkoot Lake are shown in Table 12 for parent years 1976-1981. The average brood year return for those six escapements has been 255,386 fish, representing a total return/spawner (TR/S) ratio of 3.6:1. Escapements averaged approximately 80,000. The largest return was over 350,000, from the 1979 escapement of 95,948 fish, but it is interesting to note that this return was only 70,000 fish greater than the return from the much smaller escapement of 35,452 fish in 1978. The return by age class indicated that the return was comprised of 74% age-1.3 fish, on average. Chilkoot Lake was dominated by age-1. fish, however, the relatively large contributions of age-2.3 fish in the brood year returns for 1977 and 1981 indicated that escapements above 95,000 may have been causing holdover to occur.

Brood year returns for Chilkat Lake indicate that this system was less productive than Chilkoot Lake (see Table 13). Brood year returns for 1971-1981 averaged 173,411 fish and the TR/S averaged 2.8:1. It is surprising that Chilkat Lake has been less productive given that it is heterotrophic and 6-8 degrees (Celcius) warmer than Chilkoot Lake, which is glacial. Additionally, Chilkat Lake is dominated by age-2. fish. This occurs because spawning is spread from July until the following February (Fred Bergander, ADF&G, Commercial Fisheries Division and Brad Sele, ADF&G, F.R.E.D., personal observations) compared to Chilkoot Lake where most spawning is finished by late September. The extended period for Chilkat Lake probably means that late spawning fish, which comprise the majority of the escapement, emerge so late the following year that the fry cannot grow large enough that year to smolt as age-1. fish (refer to Table 1 for size comparisons between age-1. and age-2. fish after the first freshwater year of scale growth). This relationship is further illustrated in Figure 9. You can see that age-1. fish (ages 1.1, 1.2, and 1.3) smolted at an average size of 228 incremental distance (ID). Age-2. fish (ages 2.1, 2.2, and 2.3), reached an average size of only 98 ID after their first freshwater year, and required an additional freshwater year to reach a size great enough to smolt. Age-2. fish smolted at an average size of 272 ID, not that much larger than that for age-1. fish. Age-3. fish did not smolt after 2 years in freshwater (ID=161) and smolted at 306 ID. The year prior to smolting was the year of greatest growth for all three freshwater age classes, averaging 176 ID for age-1. fish, 154 ID for age-2. fish, and 145 ID for age-3. fish. The size of the plus growth zone (growth in final spring in freshwater) decreased with increasing freshwater age.

DISCUSSION

The visual classification technique used to allocate stock groups in Lynn Canal was successful for several reasons. First, all age classes were included. All fish were classified to one of three stocks around which a complete measure of confidence (variance estimate) could be calculated. Second, high classification accuracies in all age classes meant that initial point estimates used for in-season management purposes were similar to the post-season estimates. Finally, the technique was very cost effective and required less time when compared to other stock classification methods that rely on scale pattern measurements generated from computers, genetic data, other biological markers, or a combination thereof. Stock contribution estimates from these techniques, even if classification accuracy of escapement standards had been as high as those I achieved, are much less precise because only a subset of the catch samples are used for analyses using those techniques.

Deviations from the escapement objectives for each system judge the success of management decisions to selectively harvest both runs (Chilkoot Lake and Chilkat Lake) In 1987 the escapement to Chilkoot Lake was 15,185 fish (19%) above the upper objective for that system and for Chilkat Lake the escapement was 21,407 fish (31%) below the lower objective. However, this can be not be judged as a relative failure for three reasons. First, the Chilkoot Lake run was the largest on record (430,180 fish) and 78% of that run was harvested. Second, the Chilkat Lake run was the second lowest on record (only 118,662 fish). Third, lack of accurate timely information for escapement for Chilkat Lake (timing at the weir is approximately 30 days from the fishery, on average) makes management precision for this run difficult. Fishery openings by time and area in 1987 maximized effort on the Chilkoot run and minimized impact on the Chilkat run for much of the season. Forecasting models enabled us to detect the strong return to Chilkoot Lake and the weak return to Chilkat Lake early in the season so as to adjust the fishery accordingly. A reliable method of estimating the Chilkat Lake escapement into Chilkat River would improve management precision for this run.

Estimation of the mean dates of arrival in the harvest was the first step toward catagorizing runs of Lynn Canal sockeye salmon into early, late, and average runs with respect to migratory timing. This technique was used by Mundy (1982) applied to Yukon River chinook salmon. The 1987 mean dates of harvest (MDH) indicate that the Chilkat Lake run arrived later (MDH=five days later) than the Chilkoot Lake run. This was similar to trends in 1983, 1984, 1985, and 1986 when the differences were 3, 4, 6, and 5 days later, respectively (McPherson and Jones 1987). Interannual comparisons of MDH data within a stock indicate that the 1987 harvest of both runs was earlier than average for the 4 previous years. The 1987 MDH of 31 July in the Chilkoot Lake run compares to previous years: 7 August 1983, 31 July 1984, 12 August 1985, and 17 August 1986. Similarly, the MDH in 1987 of 5 August for Chilkat Lake was generally later than the MDH's of 10 August, 4 August, 18 August, and 22 August for the respective 1983, 1984, 1985, and 1986 migrations.

The historical sockeye salmon data base is a run reconstruction data base that is presently utilized for in-season forecasting. Additionally, the continuation of the data base will allow us to evaluate optimum escapement goals in the next 2 years.

LITERATURE CITED

ADF&G (Alaska Department of Fish and Game). 1989. Report to the Board of Fisheries - Southeast Alaska and Yakutat (Region 1) 1988 finfish fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 1J89-02, Juneau.

Bergander, F. 1973. Southeastern Alaska sockeye salmon optimum escapement Studies. Anadromous Fish Conservation Act. Completion Report for the 1972 field season, AFC-40. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.

Bergander, F. 1974. Southeastern Alaska sockeye salmon optimum escapement studies. Anadromous Fish Conservation Act. Completion Report for period July 1, 1971 - June 30, 1974. AFC-40. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.

Bergander, F. 1982. Sockeye stock assessment and evaluation - S.E. Alaska. Anadromous Fish Conservation Act. Technical Report for period July 1, 1980-June 30, 1981. AFC-60-4. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.

Clutter, R. and L. Whitesel. 1956. Collection and interpretation of sockeye salmon scales. Bulletin International Pacific Salmon Fisheries Commission, No. 9. New Westminster, B.C.

Cochran, W. 1977. Sampling Techniques. 3rd ed. John Wiley & Sons, Inc. New York.

Cook, R. and G. Lord. 1978. Identification of stocks of Bristol Bay sockeye salmon by evaluating scale patterns with a polynomial discriminant method. U.S. Fish and Wildlife Service, Fishery Bulletin 76(2):415-423.

Marshall, S., F. Bergander, and S. Sharr. 1982. Origins of sockeye salmon in the Lynn Canal drift gillnet fishery of 1981 based on scale pattern analysis. Alaska Department of Fish and Game, Division of Commercial Fisheries Technical Data Report 75, Juneau.

McPherson, S. 1987. Contribution, exploitation, and migratory timing of sockeye salmon (*Oncorhynchus nerka* Walbaum) stocks to Lynn Canal in 1985 based on analysis of scale patterns. Alaska Department of Fish and Game, Division of Commercial Fisheries Technical Data Report 217, Juneau.

McPherson, S., A. McGregor, and S. Marshall. 1983. Origins of sockeye salmon (*Oncorhynchus nerka* Walbaum) in the Lynn Canal drift gillnet fishery of 1982 based on scale pattern analysis. Alaska Department of Fish and Game, Division of Commercial Fisheries Technical Data Report 87., Juneau.

LITERATURE CITED (Continued)

McPherson, S., and S. Marshall. 1986. Contribution, exploitation, and migratory timing of Chilkat & Chilkoot River runs of sockeye salmon (*Oncorhynchus nerka* Walbaum) in the Lynn Canal drift gillnet fishery of1983. Alaska Department of Fish and Game, Division of Commercial Fisheries Technical Data Report 165, Juneau.

McPherson, S. and E. Jones. 1987. Contribution, exploitation, and migratory timing of returns of sockeye salmon to Lynn Canal in 1986 based on analysis of scale patterns. Alaska Department of Fish and Game, Division of Commercial Fisheries Technical Data Report 220, Juneau.

Mosher, K. 1968. Photographic atlas of sockeye salmon scales. U.S. Fish and Wildlife Service, Fishery Bulletin 67:243-280.

Mosher, K., R.E. Anas, and K.L. Liscom. 1961. Study on scales. In Report on the investigations by the United States for the International North Pacific Fisheries Commission - 1961. International North Pacific Fisheries Commission, Annual Report 1960: 88-95.

Mundy, P.R. 1979. A quantitative measure of migratory timing illustrated by application to the management of commercial salmon fisheries. Doctoral dissertation, University of Washington, Seattle.

Mundy, P.R. 1982. Computation of migratory timing statistics for adult chinook salmon in the Yukon River, Alaska, and their relevance to fisheries management. North American Journal of Fisheries Management 2:359-370.

Oliver, G.T., S.L. Marshall, D.R. Bernard, S.A. McPherson, and S.L. Walls. 1985. Estimated contribution from Alaska and Canada stocks to the catches of sockeye salmon (*Oncorhynchus nerka*) in southern Southeastern Alaska, 1982 and 1983 based on scale pattern analysis. Alaska Department of Fish and Game, Division of Commercial Fisheries Technical Data Report 137, Juneau.

Pella, J. and T. Robertson. 1979. Assessment of composition of stock mixtures. Fishery Bulletin 77(2): 387-389.

Ryan,P., and M. Christie. 1976. Scale reading equipment. Fisheries and Marine Service, Canada, Technical Report PAC/T-75-8. Nanaimo, B.C.

Seber, G. 1982. The estimation of animal abundance and related parameters. Charles Griffin & Co. Ltd., London.

Stockley, C. 1950. The sockeye salmon of Chilkat and Chilkoot Inlets. Fisheries Research Institute paper No. 286, University of Washington, Seattle.

Table 1. Number of circuli and incremental distances in various scale growth zones for Lynn Canal sockeye salmon stocks by age class, 1987.

Stock	Age Class	Freshwater										1st Marine		N
		NC1	NC2	NC3	NCPGZ	NCTFW	S1	S2	S3	SPPZ	TSFW	NCM	SM	
Chilkat Lake	1.1	15.0			3.2	18.2	184.0			38.9	222.9	23.0	350.6	10
	1.2	14.3			3.2	17.6	175.8			40.1	215.9	24.1	359.1	17
	1.3	14.0			6.6	20.6	167.7			76.8	244.5	25.9	367.4	98
	2.1	8.5	14.4		1.7	24.6	109.6	150.5		21.3	281.4	23.0	352.1	19
	2.2	6.9	15.8		1.6	24.4	85.0	164.6		18.1	267.7	24.3	377.9	50
	2.3	7.6	13.9		2.1	23.6	98.0	145.4		22.1	265.5	26.9	407.6	50
	3.2+3.3	5.4	10.7	13.4		29.6	61.3	99.7	145.1		306.1	24.4	378.4	7
Chilkoot Lake	1.2	6.6			1.6	8.2	61.3			13.1	74.4	31.5	454.9	51
	1.3	6.2			1.4	7.6	54.4			10.8	65.1	33.4	470.6	103
	2.2	4.9	7.4		1.6	13.9	39.7	58.3		14.8	112.6	29.6	445.6	30
	2.3	4.5	5.5		1.4	11.4	38.8	37.4		10.8	87.0	31.6	446.8	24
Berners Bay/ Chilkat Mainstem	1.2	9.6			1.1	10.8	94.9			10.1	105.0	32.1	430.4	8
	1.3	8.9			2.1	11.0	92.4			17.4	109.8	32.1	427.4	101

NC1 = number of circuli in the first freshwater year.
NC2 = number of circuli in the second freshwater year.
NC3 = number of circuli in the third freshwater year.
NCPGZ = number of circuli in the plus growth zone.
NCTFW = number of circuli in the total freshwater zone.
S1 = size of the first freshwater year.
S2 = size of the second freshwater year.
S3 = size of the third freshwater year.
SPGZ = size of the plus growth zone.
TSFW = size of the total freshwater growth zone.
NCM = number of circuli in the first marine year.
SM = size of the first marine year.

Table 2. (page 2 of 2)

Model: Fish age-2.2

Actual Stock of Origin	Sample Size	Classified Group of Origin: Chilkoot	Chilkat	Berners/Mainstem
Chilkoot	8	1.000		
Chilkat	90		1.000	
Berners/Mainstem	0			
	98	Overall Classification Accuracy =		1.000

Model: Fish age-2.3

Actual Stock of Origin	Sample Size	Classified Group of Origin: Chilkoot	Chilkat	Berners/Mainstem
Chilkoot	96	0.990	0.010	
Chilkat	101	0.010	0.990	
Berners/Mainstem	2			1.000
	199	Overall Classification Accuracy =		0.990

Model: Fish age-2.4

Actual Stock of Origin	Sample Size	Classified Group of Origin: Chilkoot	Chilkat	Berners/Mainstem
Chilkoot	3	1.000		
Chilkat	1		1.000	
Berners/Mainstem	0			
	4	Overall Classification Accuracy =		1.000

Model: Fish age-3.2

Actual Stock of Origin	Sample Size	Classified Group of Origin: Chilkoot	Chilkat	Berners/Mainstem
Chilkoot	1	1.000		
Chilkat	8		1.000	
Berners/Mainstem	0			
	9	Overall Classification Accuracy =		1.000

Model: Fish age-3.3

Actual Stock of Origin	Sample Size	Classified Group of Origin: Chilkoot	Chilkat	Berners/Mainstem
Chilkoot	1	1.000		
Chilkat	3		1.000	
Berners/Mainstem	0			
		Overall Classification Accuracy =		1.000

Table 2. Classification matrices for visual classification models of individual age classes of sockeye salmon stocks contributing to the Lynn Canal (District 115) drift gill net fishery, 1987.

Model: Fish age-1.1

Actual Stock of Origin	Sample Size	Classified Group of Origin		
		Chilkoot	Chilkat	Berners/Mainstem
Chilkoot	1	1.000		
Chilkat	12		1.000	
Berners/Mainstem	0			
	13	Overall Classification Accuracy =		1.000

Model: Fish age-1.2

Actual Stock of Origin	Sample Size	Classified Group of Origin		
		Chilkoot	Chilkat	Berners/Mainstem
Chilkoot	63	1.000		
Chilkat	26		0.962	0.038
Berners/Mainstem	8			1.000
	97	Overall Classification Accuracy =		.990

Model: Fish age-1.3

Actual Stock of Origin	Sample Size	Classified Group of Origin		
		Chilkoot	Chilkat	Berners/Mainstem
Chilkoot	100	0.950		0.050
Chilkat	99		0.980	0.020
Berners/Mainstem	98	0.010	0.010	0.980
	297	Overall Classification Accuracy =		0.970

Model: Fish age-1.4

Actual Stock of Origin	Sample Size	Classified Group of Origin		
		Chilkoot	Chilkat	Berners/Mainstem
Chilkoot	5	1.000		
Chilkat	1		1.000	
Berners/Mainstem	0			
	6	Overall Classification Accuracy =		1.000

-Continued-

Table 3. Comparison of in-season versus post-season weekly stock composition estimates of the Lynn Canal sockeye salmon harvest, 1987.

Statistical Week	Chilkoot		Chilkat		Berners/Mainstem	
	In-season	Post-season	In-season	Post-season	In-season	Post-season
26	0.619	0.649	0.249	0.252	0.132	0.098
27	0.582	0.609	0.130	0.132	0.288	0.259
28	0.623	0.651	0.209	0.212	0.168	0.137
29	0.820	0.852	0.127	0.131	0.053	0.017
30	0.884	0.897	0.096	0.098	0.020	0.005
31	0.847	0.868	0.124	0.125	0.029	0.007
32	0.828	0.846	0.151	0.150	0.021	0.003
33	0.798	0.812	0.188	0.185	0.014	0.002
34	0.787	0.796	0.205	0.201	0.008	0.003
35	0.667	0.676	0.325	0.323	0.008	0.001
36	0.499	0.504	0.496	0.496	0.005	0.000
37	0.285	0.285	0.709	0.713	0.006	0.003
38-42	0.094	0.088	0.906	0.912	0.000	0.000
Total [a]	0.787	0.806	0.172	0.169	0.041	0.026

[a] Weighted by weekly catches.

Table 4. Fishery openings, effort, harvest, and CPUE of sockeye salmon in Lynn Canal (District 115) by date and statistical week, 1987.

Stat. Week	Dates Fished	Hours open 15A	15B	15C	Weekly District Maximum	Boats	Catch	CPUE Fish/ Boatday	Average Weight in kg	Catch Dollar Value
26	06/21-06/24	72	0	0	72	57	7,452	44	3.22	$95,102
27	06/28-07/01	72	24	48	72	92	26,820	97	3.22	$342,760
28	07/05-07/08	48	0	72	72	109	7,159	22	3.14	$90,163
29	07/12-07/16	96	0	72	96	106	52,010	123	3.13	$645,028
30	07/19-07/22	72	0	72	72	173	51,357	99	3.10	$632,307
31	07/26-07/30	72	0	96	96	179	48,444	68	3.19	$545,673
32	08/02-08/07	120	0	72	120	207	101,627	98	3.17	$1,134,970
33	08/09-08/12	72	0	0	72	208	51,004	82	3.18	$589,938
34	08/17-08/20	72	0	0	72	230	40,670	59	3.18	$513,174
35	08/23-08/26	72	0	24	72	187	19,981	36	3.18	$253,159
36	08/30-09/02	72	0	24	72	157	5,031	11	3.21	$64,025
37	09/06-09/08	48	0	48	48	208	2,560	6	3.34	$34,150
38	09/13-09/15	48	0	48	48	218	1,089	2	3.35	$14,486
39	09/20-09/22	48	0	48	48	177	521	1	3.29	$6,799
40	09/27-09/29	48	0	48	48	39	48	1	3.03	$579
41	10/04-10/05	24	0	24	24	16	18	1	3.25	$232
42	10/11-10/12	24	0	24	24	15	24	2	2.85	$273
Total		1,080	24	720	1,128	2,378	415,815	751	3.17	$5,050,156

-Continued-

Notes to openings:

Section 15-A

1. June 21-24: open south of the latitude of the southernmost tip of Seduction Point.

2. June 28-July 1: open in Lynn Canal south of the latitude of the southernmost tip of Seduction Point through noon June 30 and in Chilkoot Inlet north of the latitude of Mud Bay (Flat Bay) Point through 12:00 noon July 1.

3. July 5-7: open in Lynn Canal south of the latitude of the southernmost tip of Seduction Point and in Chilkoot Inlet north of the latitude of Mud Bay (Flat Bay) Point with Lutak Inlet closed north and west of a point from 59°18′ N. latitude, 135°30′42" W. longitude to a point at 59°18"42" N. latitude, 135°29′48" W. longitude.

4. July 12-16: open in Lynn Canal south of the latitude of the southernmost tip of Talsani Island through noon July 14 and in Chilkoot Inlet north of the tip of the latitude of Mud Bay (Flat Bay) Point through 12:00 noon July 16 with Lutak Inlet closed same as on July 5-7.

5. July 19-22: open in Lynn Canal south of the latitude of the southernmost tip of Talsani Island and in Chilkoot Inlet north of the latitude of Mud Bay (Flat Bay) Point with Lutak Inlet closed same as on July 5-7.

6. July 26-29: open in Lynn Canal south of the latitude of the southernmost tip of Talsani Island through 12:00 noon July 28 and in Chilkoot Inlet north of the latitude of Mud Bay (Flat Bay) Point through 12:00 noon July 29 with Lutak Inlet closed same as on July 5-7.

7. August 2-7: open in Lynn Canal south of the latitude of the southernmost tip of Talsani Island through 12:00 noon August 4 and in Chilkoot Inlet north of the latitude of Mud Bay (Flat Bay) Point through 12:00 noon August 7 with Lutak Inlet open to the mouth of the Chilkoot River.

8. August 9-12: open in Lynn Canal south of the latitude of the southernmost tip of Talsani Island through 12:00 noon August 11 and in Chilkoot Inlet north of the latitude of Mud Bay (Flat Bay) Point through 12:00 noon August 12 with Lutak Inlet open same as on August 2-7.

9. August 17-20: open in Lynn Canal south of the latitude of the southernmost tip of Talsani Island through 12:00 noon August 19 and in Chilkoot Inlet north of the latitude of Mud Bay (Flat Bay) point through 12:00 noon August 20 with Lutak Inlet open the same as on August 2-7.

10. August 23-26: open in Lynn Canal south of the latitude of the southernmost tip of Talsani Island through 12:00 noon August 24 and in Chilkoot Inlet north of the latitude of Mud Bay (Flat Bay) Point through 12:00 noon August 26 with Lutak Inlet open the same as on August 2-7.

11. August 30-September 2: open in Lynn Canal south of the latitude of the southernmost tip of Talsani Island through 12:00 noon August 31 and in Chikoot Inlet north of the latitude of Mud Bay (Flat Bay) Point through 12:00 noon September 2 with Lutak Inlet open the same as on August 2-7.

-Continued-

12. September 6-8: open with Lutak Inlet open as on August 2-7, Chilkat Inlet closed north of the latitude of the southernmost tip of Seduction Point, and a minimum gillnet mesh size restriction of six and one-quarter inches in all areas except Lutak Inlet northwest of a line between Tahani Point and Taiya Point.

13. September 13-15 and 20-22: open with Chilkat Inlet closed north of a line from the Glacier Point marker to the westernmost tip of Twin Coves at 59°06'35" N. latitude, 135°21'42" W. longitude.

14. September 27-29: open with Chilkat Inlet closed north of the latitude of the southernmost tip of Seduction Point.

15. October 4-5: open with Chilkat Inlet closed the same as on September 13-15.

16. October 11-12: open with Chilkat Inlet closed the same as on September 27-29.

Section 15-B

1. June 28-29: open south of the latitude of Point St. Mary.

Section 15-C

1. June 28-30: open south of the latitude of Point Bridget and north and west of a line from a point on the eastern shore at the latitude of Vanderbilt Reef Light to Vanderbilt Reef Light to Little Island Light and then due west to the western shore.

2. July 5-8: open within two nautical miles of the western shore of Lynn Canal north of 58°40'48" N. latitude.

3. July 12-15: open within two nautical miles of the western shore of Lynn Canal.

4. July 19-22: open within two nautical miles of the western shore of Lynn Canal through 12:00 noon July 21 and within two nautical miles of the shore of Lynn Canal north of the latitude of Point Bridget through 12:00 noon July 22 with the Endicott River closed within a radius of one nautical mile of the mouth and William Henry Bay closed within a radius of one-half nautical mile of the Beardslee River mouth for the entire period.

5. July 26-30 and August 2-5: open within two nautical miles of the shore of Lynn Canal north of 58°40'48" N. latitude (the latitude of Point Bridgrt) with the Endicott River and William Henry Bay closed same as on July 19-22.

6. August 23-24: open within one nautical mile of the eastern shore of Lynn Canal south of the latitude of Point Bridget.

7. August 30-31: open in the entire section.

8. September 6-8: open in the entire section with a minimum gillnet mesh size restriction of six and one-quarter inches.

9. September 13-15, 20-22, 27-29, October 4-5, and 11-12: open south of the latitude of Point Bridget.

Table 5. Estimated contribution of Lynn Canal sockeye salmon stocks to the Lynn Canal (District 115) drift gill net fishery by fishing period, 1987.

Stat Week		Chilkoot Lake	Chilkat Lake	Berners Bay + Chilkat Mainstem	Total
26	Catch	4,838	1,880	734	7,452
	Percent	64.9	25.2	9.8	100.0
	Std. Error	116	108	139	
27	Catch	16,332	3,530	6,958	26,820
	Percent	60.9	13.2	25.9	100.0
	Std. Error	558	306	548	
28	Catch	4,660	1,516	983	7,159
	Percent	65.1	21.2	13.7	100.0
	Std. Error	155	119	137	
29	Catch	44,328	6,810	872	52,010
	Percent	85.2	13.1	1.7	100.0
	Std. Error	555	528	205	
30	Catch	46,056	5,038	263	51,357
	Percent	89.7	9.8	0.5	100.0
	Std. Error	520	511	118	
31	Catch	42,042	6,072	330	48,444
	Percent	86.8	12.5	0.7	100.0
	Std. Error	866	860	150	
32	Catch	85,999	15,278	350	101,627
	Percent	84.6	15.0	0.3	100.0
	Std. Error	1,007	995	162	
33	Catch	41,439	9,454	111	51,004
	Percent	81.2	18.5	0.2	100.0
	Std. Error	705	704	75	
34	Catch	32,383	8,166	121	40,670
	Percent	79.6	20.1	0.3	100.0
	Std. Error	552	553	72	
35	Catch	13,503	6,456	22	19,981
	Percent	67.6	32.3	0.1	100.0
	Std. Error	333	367	5	
36	Catch	2,537	2,494	0	5,031
	Percent	50.4	49.6	0.0	100.0
	Std. Error	109	109	0	
37	Catch	728	1,825	7	2,560
	Percent	28.4	71.3	0.3	100.0
	Std. Error	65	68	7	
38-42	Catch	150	1,550	0	1,700
	Percent	8.8	91.2	0.0	100.0
	Std. Error	29	29	0	
Total	Catch	334,995	70,069	10,751	415,815
	Percent	80.6	16.9	2.6	
	Std. Error	1,860	1,774	671	

Table 6. Catch, escapement, total run, and exploitation rates of Lynn Canal sockeye salmon by age class and system, 1987.

		Brood Year and Age Class													
		1984		1983			1982			1981			1980		
System		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total
Chilkoot Lake															
Catch	N		27		19,266			227,877	2,455	413	84,578		160	219	334,995
	%				5.8			68.0	0.7	0.1	25.2		0.0	0.1	100.0
Escapement	N				7,884			62,811	2,119	271	21,887		140	73	95,185
	%				8.3			66.0	2.2	0.3	23.0		0.1	0.1	100.0
Total Run	N		27		27,150			290,688	4,574	684	106,465		300	292	430,180
	%		0.0		6.3			67.6	1.1	0.2	24.7		0.1	0.1	100.0
Expl. Rate			1.00		0.71			0.78	0.54	0.60	0.79		0.53	0.75	0.78
Chilkat Lake															
Catch	N				770			23,774	18,844	27	26,031	288	93	242	70,069
	%				1.1			33.9	26.9	<0.1	37.2	0.4	0.1	0.3	100.0
Escapement	N		711		921	1,555		11,713	17,507		15,764	357	2	63	48,593
	%		1.5		1.9	3.2		24.1	36.0		32.4	0.7	<0.1	0.1	100.0
Total Run	N		711		1,691	1,555		35,487	36,351	27	41,795	645	95	305	118,662
	%		0.6		1.4	1.3		29.9	30.6	<0.1	35.2	0.5	0.1	0.3	100.0
Expl. Rate			0.00		0.46	0.00		0.67	0.52	1.00	0.62	0.45	0.98	0.79	0.59
Berners Bay/ Chilkat Mainstem															
Catch	N	56		6,039	564		54	3,867	70		101				10,751
	%	0.5		56.2	5.2		0.5	36.0	0.7		0.9				100.0
Lace River Escapement	%			32.3	4.5			62.4			0.8				100.0
Chilkat Mainstem Escapement	%	9.8		9.8	3.9			74.5			2.0				100.0

Table 7. Average length of sockeye salmon catches and escapements in Lynn Canal by sex and age class, 1987.

		Brood Year and Age Class												
		1984		1983			1982			1981			1980	
		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	2.4	3.3
Chilkat Lake														
District 115 Catch														
Male	Avg. Length				550			602	566		615			628
	Std. Error							4.4	3.1		2.8			13.6
	Sample Size				1			72	92		122			3
Female	Avg. Length				520			597	554	625	596	567		
	Std. Error				5.0			2.0	3.3		2.2	12.0		
	Sample Size				2			102	64	1	132	3		
All Fish	Avg. Length				530			599	561	625	605	567		628
	Std. Error				10.4			2.2	2.3		1.9	12.0		13.6
	Sample Size				3			175	156	1	254	3		3
Escapement														
Male	Avg. Length		338		507	352		604	538		606	470	565	585
	Std. Error		3.9		11.5	6.2		2.1	2.6		2.1			15.0
	Sample Size		13		20	40		198	247		314	1	1	2
Female	Avg. Length				514			590	530		589	534		680
	Std. Error				12.4			1.9	1.8		1.8	7.7		
	Sample Size				7			160	252		198	7		1
All Fish	Avg. Length		338		509	352		598	534		600	526	565	617
	Std. Error		3.9		9.0	6.2		1.5	1.6		1.5	10.5		32.8
	Sample Size		13		27	40		358	499		512	8	1	3
Chilkoot Lake														
Distict 115 Catch														
Male	Avg. Length				504			595	512		599			
	Std. Error				5.0			1.3	10.5		1.5			
	Sample Size				70			640	10		253			
Female	Avg. Length				514			585	528	590	585			
	Std. Error				6.7			0.8	7.8		1.3			
	Sample Size				41			743	5	1	280			
All Fish	Avg. Length				508			590	517	590	592			
	Std. Error				4.0			0.7	7.6		1.0			
	Sample Size				111			1386	15	1	533			
Escapement														
Male	Avg. Length				469			590	465	635	591		600	560
	Std. Error				3.1			1.0	5.9	5.0	1.5		10.2	
	Sample Size				143			813	33	2	240		2	1
Female	Avg. Length				466			576	488	565	573		590	
	Std. Error				6.8			0.9	8.4	18.9	2.0			
	Sample Size				42			714	16	3	197		1	
All Fish	Avg. Length				469			583	472	593	583		597	560
	Std. Error				2.9			0.7	5.0	20.1	1.3		6.7	
	Sample Size				185			1527	49	5	437		3	1

-Continued-

Table 7. (page 2 of 2)

		Brood Year and Age Class												
		1984		1983			1982			1981			1980	
		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	2.4	3.3
Berners Bay/Chilkat Mainstem														
Distict 115 Catch														
Male	Avg. Length	545		601	525		600	605	450		589			
	Std. Error			3.5	5.0			3.1			10.0			
	Sample Size	1		50	7		1	43	1		5			
Female	Avg. Length			588	505			595			583			
	Std. Error			2.5	5.0			2.8			22.5			
	Sample Size			46	2			55			2			
All Fish	Avg. Length	545		595	521		600	600	450		587			
	Std. Error			2.2	4.4			3.0			8.6			
	Sample Size	1		96	10		1	98	1		7			
Lace River Escapement														
Male	Avg. Length			594	473			598			640			
	Std. Error			4.9	17.4			2.6						
	Sample Size			30	3			57			1			
Female	Avg. Length			562	510			575						
	Std. Error			6.5	10.0			4.0						
	Sample Size			13	3			26						
All Fish	Avg. Length			584	492			591			640			
	Std. Error			4.5	12.2			2.5						
	Sample Size			43	6			83			1			
Chilkat River Mainstem Escapement														
Male	Avg. Length	441		613	438			592			585			
	Std. Error	13.3		12.5	7.5			4.4						
	Sample Size	5		2	2			16			1			
Female	Avg. Length			563				572						
	Std. Error			13.6				4.1						
	Sample Size			3				22						
All Fish	Avg. Length	441		583	438			580			585			
	Std. Error	13.3		14.7	7.5			3.4						
	Sample Size	5		5	2			38			1			

Table 8. Cumulative migratory time densities, mean dates of arrival, and variance for major age classes of sockeye salmon stocks which returned to Lynn Canal, 1987.

Catches in District 115

Statistical Week	Dates	Stock Group and Age Class: Chilkoot Lake 1.2	Chilkoot Lake 1.3	Chilkoot Lake 2.3	Chilkoot Lake Total	Chilkat Lake 1.2	Chilkat Lake 1.3	Chilkat Lake 2.2	Chilkat Lake 2.3	Chilkat Lake Total	Berners/Mainstem 0.3	Berners/Mainstem 1.3	Berners/Mainstem Total
26	6/21-6/27	0.004	0.020	0.002	0.014	0.032	0.066	0.003	0.009	0.027	0.038	0.118	0.068
27	6/28-7/04	0.035	0.087	0.007	0.063	0.141	0.178	0.012	0.032	0.077	0.639	0.883	0.715
28	7/05-7/11	0.053	0.105	0.009	0.077	0.185	0.219	0.018	0.046	0.099	0.716	1.000	0.807
29	7/12-7/18	0.221	0.278	0.024	0.209	0.435	0.418	0.042	0.102	0.196	0.845	1.000	0.888
30	7/19-7/25	0.468	0.448	0.051	0.347	0.582	0.556	0.061	0.149	0.268	0.880	1.000	0.912
31	7/26-8/01	0.635	0.592	0.118	0.472	0.778	0.677	0.115	0.227	0.355	0.928	1.000	0.943
32	8/02-8/08	0.897	0.829	0.424	0.729	0.959	0.916	0.346	0.421	0.573	0.974	1.000	0.976
33	8/09-8/15	0.941	0.915	0.670	0.853	0.959	0.974	0.573	0.564	0.708	0.993	1.000	0.986
34	8/16-8/22	0.978	0.970	0.887	0.949	0.959	0.989	0.761	0.724	0.824	0.999	1.000	0.997
35	8/23-8/29	0.999	0.994	0.977	0.990	0.990	0.994	0.901	0.857	0.916	0.999	1.000	0.999
36	8/30-9/05	0.999	0.999	0.994	0.997	0.990	0.997	0.956	0.908	0.952	0.999	1.000	0.999
37	9/06-9/12	1.000	1.000	0.999	1.000	0.999	0.999	0.981	0.957	0.978	1.000	1.000	1.000
38-42	9/13-10/17	1.000	1.000	1.000	1.000	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Mean Stat. Week		30.8	30.8	32.8	31.3	30.0	30.0	33.2	33.0	32.0	28.0	27.0	27.7
Mean Calendar Date		7/27	7/27	8/10	7/31	7/22	7/22	8/13	8/12	8/5	7/8	7/1	7/6
Variance		2.8	4.2	2.2	4.4	4.1	4.7	3.7	6.4	7.3	3.0	0.2	2.6
Std. Error		1.7	2.0	1.5	2.1	2.0	2.2	1.9	2.5	2.7	1.7	0.5	1.6

Escapements

Period Dates	Statistical Week	Stock Group and Age Class: Chilkoot Lake 1.2	Chilkoot Lake 1.3	Chilkoot Lake 2.3	Chilkoot Lake Total	Period Dates	Statistical Week	Chilkat Lake 1.2	Chilkat Lake 1.3	Chilkat Lake 2.2	Chilkat Lake 2.3	Chilkat Lake Total
6/4-6/27	25.7	0.096	0.240	0.036	0.178	6/18-7/11	27.5	0.254	0.267	0.013	0.024	0.084
6/28-7/11	27.2	0.183	0.381	0.063	0.286	7/12-7/18	29.2	0.368	0.549	0.042	0.101	0.199
7/12-7/25	29.4	0.425	0.563	0.131	0.445	7/19-7/25	29.7	0.393	0.688	0.055	0.125	0.251
7/26-8/1	30.9	0.640	0.659	0.172	0.539	7/26-8/22	33.4	0.530	0.817	0.084	0.181	0.329
8/2-8/8	32.0	0.804	0.762	0.255	0.644	8/23-8/29	35.0	0.710	0.930	0.211	0.296	0.456
8/9-8/15	33.1	0.828	0.814	0.356	0.706	8/30-9/5	35.9	0.733	0.943	0.253	0.341	0.490
8/16-8/22	33.9	0.963	0.929	0.731	0.884	9/6-9/19	38.2	0.742	0.947	0.260	0.347	0.495
8/23-10/18	35.5	1.000	1.000	1.000	1.000	9/20-9/26	39.0	0.899	0.997	0.809	0.818	0.867
						9/27-10/3	39.9	0.997	0.999	0.996	0.986	0.993
						10/4-11/20	43.8	1.000	1.000	1.000	1.000	1.000
Mean Stat. Week		30.5	29.8	33.2	30.7			33.3	30.7	37.8	37.0	35.5
Mean Calendar Date		7/25	7/20	8/13	7/29			8/14	7/27	9/14	9/9	8/29
Variance		6.5	10.4	5.9	11.1			21.4	10.9	7.9	13.3	19.6
Std. Error		2.6	3.2	2.4	3.3			4.6	3.3	2.8	3.7	4.4

Table 9. Catch, escapement, total runs, and exploitation of Lynn Canal sockeye salmon stocks, calendar years 1967-1987.

	Spawning Stock															
	Chilkat Lake					Chilkoot Lake					Berners Bay + Chilkat Mainstem		Lynn Canal Total			
Year	Catch	Esc.	Total Run	% Total Catch	Expl. Rate	Catch	Esc.	Total Run	% Total Catch	Expl. Rate	Catch	% Total Catch	Catch	Esc.	Total Run	Expl. Rate
1967		20,111											71,399			
1968		41,246											84,398			
1969		44,555											133,447			
1970		41,085											82,938			
1971		49,342											76,684			
1972		51,850											84,062			
1973		50,527											193,701			
1974		82,811											152,015			
1975		41,520											18,338			
1976	59,328	69,729	129,057	46.9	0.46	62,452	71,297	133,749	49.3	0.47	4,842	3.8	126,622	141,026	267,648	0.47
1977	41,389	41,044	82,433	25.9	0.50	113,313	97,051	210,364	70.8	0.54	5,377	3.4	160,079	138,095	298,174	0.54
1978	89,558	67,528	157,086	82.6	0.57	14,264	35,454	49,718	13.1	0.29	4,658	4.3	108,480	102,982	211,462	0.51
1979	115,994	80,589	196,583	60.1	0.59	69,864	95,946	165,810	36.2	0.42	7,116	3.7	192,974	176,535	369,509	0.52
1980	30,681	95,347	126,028	57.8	0.24	20,846	96,512	117,358	39.3	0.18	1,558	2.9	53,085	191,859	244,944	0.22
1981	48,460	84,089	132,549	51.9	0.37	43,792	83,372	127,164	46.9	0.34	1,071	1.1 1/	93,323	167,461	260,784	0.36
1982	127,036	80,221	207,257	46.4	0.61	144,592	102,973	247,565	52.9	0.58	1,908	0.7 1/	273,536	183,194	456,730	0.60
1983	123,888	134,207	258,095	33.5	0.48	241,469	80,343	321,812	65.4	0.75	3,955	1.1 1/	369,312	214,550	583,862	0.63
1984	98,233	115,269	213,502	29.4	0.46	231,792	100,417	332,209	69.3	0.70	4,348	1.3 1/	334,373	215,686	550,059	0.61
1985	148,590	57,724	206,314	46.4	0.72	155,773	69,026	224,799	48.6	0.69	16,178	5.0	320,541	126,750	447,291	0.72
1986	168,361	23,947	192,308	58.0	0.88	110,430	88,024	198,454	38.1	0.56	11,414	3.9	290,205	111,971	402,176	0.72
1987	70,069	48,593	118,662	16.9	0.59	334,995	95,185	430,180	80.6	0.78	10,751	2.6	415,815	143,778	559,593	0.74
1976-87																
Mean	93,466	74,857	168,323	46.3	0.54	128,632	84,633	213,265	50.9	0.52	6,098	2.8	228,195	159,491	387,686	0.55
Min	30,681	23,947	82,433	16.9	0.24	14,264	35,454	49,718	13.1	0.18	1,071	0.7	53,085	102,982	211,462	0.22
Max	168,361	134,207	258,095	82.6	0.88	334,995	102,973	430,180	80.6	0.78	16,178	5.0	415,815	215,686	583,862	0.74

1/ Catch broken out for age-0. fish only.

Table 10. Age composition of sockeye salmon in the Chilkoot Lake total run for calendar years 1976-1987.

Part A - in numbers of fish.

	Age class											by freshwater age class		
Year	1.1	1.2	2.1	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total	1.	2.	3.
1976	760	30,332		48,038	9,799		44,820				133,749	79,130	54,619	0
1977		8,149		154,743	6,066	267	41,139				210,364	163,159	47,205	0
1978		6,167		30,258	2,269	78	10,946				49,718	36,503	13,215	0
1979		37,827		92,557	7,413		27,925	88			165,810	130,384	35,338	88
1980		8,933		68,923	9,523	25	29,641	313			117,358	77,881	39,164	313
1981	24	9,556		96,992	2,870	270	17,380		22	50	127,164	106,842	20,272	50
1982		30,050		200,862	2,024	1,420	13,097	4		108	247,565	232,332	15,121	112
1983	89	16,866	45	223,061	1,981	980	78,744		46		321,812	240,996	80,816	0
1984		10,044		297,669	659	1,403	22,295		139		332,209	309,116	23,093	0
1985	196	17,011	7	169,248	3,154	4,342	30,390	56	365	30	224,799	190,797	33,916	86
1986	43	18,293		145,214	3,452	1,016	29,935		325	176	198,454	164,566	33,712	176
1987	27	27,150		290,688	4,574	684	106,465		300	292	430,180	318,549	111,339	292
Mean	86	18,215	6	162,389	5,642	985	43,453	33	164	214	231,187	181,675	49,265	247

Part B - percent of total.

1976	0.6	22.7		35.9	7.3		33.5				100.0	59.2	40.8	0.0
1977		3.9		73.6	2.9	0.1	19.6				100.0	77.6	22.4	0.0
1978		12.4		60.9	4.6	0.2	22.0				100.0	73.4	26.6	0.0
1979		22.8		55.8	4.5		16.8	0.1			100.0	78.6	21.3	0.1
1980		7.6		58.7	8.1	0.0	25.3	0.3			100.0	66.4	33.4	0.3
1981	0.0	7.5		76.3	2.3	0.2	13.7		0.0	0.0	100.0	84.0	15.9	0.0
1982		12.1		81.1	0.8	0.6	5.3	0.0		0.0	100.0	93.8	6.1	0.0
1983	0.0	5.2	0.0	69.3	0.6	0.3	24.5		0.0		100.0	74.9	25.1	0.0
1984		3.0		89.6	0.2	0.4	6.7		0.0		100.0	93.0	7.0	0.0
1985	0.1	7.6	0.0	75.3	1.4	1.9	13.5	0.0	0.2	0.0	100.0	84.9	15.1	0.0
1986	0.0	9.2		73.2	1.7	0.5	15.1		0.2	0.1	100.0	82.9	17.0	0.1
1987	0.0	6.3		67.6	1.1	0.2	24.7		0.1	0.1	100.0	74.1	25.9	0.1
Mean	0.1	9.3	0.0	68.0	3.1	0.4	19.0	0.0	0.1	0.1	100.0	77.8	22.1	0.1

Part C - Exploitation rates by age class.

1976	0.00	0.27		0.44	0.33		0.67				0.47	0.37	0.61	
1977		0.32		0.57	0.28	0.42	0.49				0.54	0.56	0.47	
1978		0.36		0.28	0.14	1.00	0.30				0.29	0.29	0.27	
1979		0.23		0.51	0.19		0.45	0.22			0.42	0.43	0.40	0.22
1980		0.08		0.21	0.05	0.12	0.18	0.06			0.18	0.19	0.15	0.06
1981	0.00	0.10		0.40	0.06	0.27	0.20		1.00	1.00	0.34	0.38	0.18	1.00
1982		0.35		0.60	0.75	0.31	0.93	1.00		1.00	0.58	0.56	0.91	1.00
1983	0.00	0.42	0.00	0.78	0.36	0.75	0.74		1.00		0.75	0.76	0.73	
1984		0.53		0.71	0.48	0.30	0.62		1.00		0.70	0.70	0.62	
1985	0.76	0.51	1.00	0.73	0.44	0.62	0.64	0.18	0.39	1.00	0.69	0.71	0.62	0.47
1986	0.00	0.38		0.59	0.39	0.51	0.51		0.68	0.69	0.56	0.57	0.50	0.69
1987	1.00	0.71		0.78	0.54	0.60	0.79		0.53	0.75	0.78	0.78	0.78	0.75
Mean	0.20	0.46	0.14	0.64	0.43	0.47	0.63	0.10	0.47	0.38	0.62	0.62	0.61	0.36

Table 11. Age composition of sockeye salmon in the Chilkat Lake total run for calendar years 1976-1987.

Part A - in numbers of fish.

	Age Class													by freshwater age class		
Year	1.1	0.3	1.2	2.1	1.3	2.2	3.1	1.4	2.3	3.2	2.4	3.3	Total	1.	2.	3.
1976	175		5,743	1,050	21,178	65,584			34,535	656		136	129,057	27,096	101,169	792
1977			2,793		19,708	41,592			18,340				82,433	22,501	59,932	0
1978			9,715		16,232	84,795			45,651	693			157,086	25,947	130,446	693
1979			3,975		55,523	98,469			37,782	165		669	196,583	59,498	136,251	834
1980			3,053		9,184	68,309			35,322	10,160			126,028	12,237	103,631	10,160
1981			1,717	83	21,729	50,546		56	57,075	933	20	390	132,549	23,502	107,724	1,323
1982	220		3,503	1,550	32,174	69,986			97,129	1,799		896	207,257	35,897	168,665	2,695
1983	967		6,720	4,478	73,011	69,181		95	103,005	435	23	180	258,095	80,793	176,687	615
1984	134	41	2,438	1,756	68,712	88,155		117	51,630	295	83	141	213,502	71,401	141,624	436
1985	444		1,124	2,229	28,755	52,774	125	666	119,535	582	57	23	206,314	30,989	174,595	730
1986			4,206	470	13,851	56,490		22	114,318	2,487	79	385	192,308	18,079	171,357	2,872
1987	711		1,691	1,555	35,487	36,351		27	41,795	645	95	305	118,662	37,916	79,796	950
Mean	199	3	3,621	945	38,239	63,579	9	89	64,069	1,379	28	261	172,423	42,148	128,622	1,649

Part B - percent of total.

1976	0.1		4.4	0.8	16.4	50.8			26.8	0.5		0.1	100.0	21.0	78.4	0.6
1977			3.4		23.9	50.5			22.2				100.0	27.3	72.7	0.0
1978			6.2		10.3	54.0			29.1	0.4			100.0	16.5	83.0	0.4
1979			2.0		28.2	50.1			19.2	0.1		0.3	100.0	30.3	69.3	0.4
1980			2.4		7.3	54.2			28.0	8.1			100.0	9.7	82.2	8.1
1981			1.3	0.1	16.4	38.1		0.0	43.1	0.7	0.0	0.3	100.0	17.7	81.3	1.0
1982	0.1		1.7	0.7	15.5	33.8			46.9	0.9		0.4	100.0	17.3	81.4	1.3
1983	0.4		2.6	1.7	28.3	26.8		0.0	39.9	0.2	0.0	0.1	100.0	31.3	68.5	0.2
1984	0.1	0.0	1.1	0.8	32.2	41.3		0.1	24.2	0.1	0.0	0.1	100.0	33.4	66.3	0.2
1985	0.2		0.5	1.1	13.9	25.6	0.1	0.3	57.9	0.3	0.0	0.0	100.0	15.0	84.6	0.4
1986			2.2	0.2	7.2	29.4		0.0	59.4	1.3	0.0	0.2	100.0	9.4	89.1	1.5
1987	0.6		1.4	1.3	29.9	30.6		0.0	35.2	0.5	0.1	0.3	100.0	32.0	67.2	0.8
Mean	0.1	0.0	2.3	0.5	21.2	38.0	0.0	0.0	36.7	1.0	0.0	0.2	100.0	23.6	75.3	1.1

Part C - Exploitation rates by age class.

1976	0.00		0.47	0.00	0.32	0.53			0.42	0.47		1.00	0.46	0.35	0.49	0.56
1977			0.47		0.60	0.43			0.58				0.50	0.58	0.47	
1978			0.33		0.29	0.61			0.64	0.65			0.57	0.31	0.62	0.65
1979			0.89		0.46	0.72			0.39	1.00		0.92	0.59	0.49	0.63	0.93
1980			0.23		0.14	0.22			0.32	0.23			0.24	0.16	0.25	0.23
1981			0.82	1.00	0.53	0.22		0.00	0.42	0.09	1.00	1.00	0.37	0.55	0.33	0.36
1982	0.00		0.54	0.00	0.76	0.45			0.71	0.20		0.29	0.61	0.73	0.59	0.23
1983	0.10		0.44	0.00	0.41	0.37		0.76	0.63	0.45	0.00	0.68	0.48	0.41	0.51	0.52
1984	0.00		0.23	0.00	0.62	0.30		0.40	0.55	0.16	0.57	0.64	0.46	0.61	0.39	0.31
1985	0.00		0.62	0.10	0.78	0.58	0.23	0.76	0.79	0.63	1.00	1.00	0.72	0.76	0.71	0.57
1986			0.60	0.00	0.94	0.90		1.00	0.87	0.85	1.00	0.67	0.88	0.86	0.88	0.82
1987	0.00		0.46	0.00	0.67	0.52		1.00	0.62	0.45	0.98	0.79	0.59	0.65	0.56	0.56
Mean	0.08	0.00	0.53	0.22	0.56	0.51	0.02	0.34	0.59	0.43	0.39	0.57	0.55	0.55	0.55	0.47

Table 12. Brood year returns and return/spawner of Chilkoot Lake sockeye salmon for parent years 1976-1981.

Part A - Numbers of fish by age class.

Brood Year	Escapement	3-Year	4-Year		5-Year		6-Year			7-Year		Total	Return/ Spawner
		1.1	1.2	2.1	1.3	2.2	1.4	2.3	3.2	2.4	3.3		
1976	71,294		8,933		96,992	2,870	1,420	13,097	4	46		123,362	1.7
1977	97,215		9,556		200,862	2,024	980	78,744		139		292,305	3.0
1978	35,452	24	30,050		223,061	1,981	1,403	22,295		365	30	279,209	7.9
1979	95,948		16,866	45	297,669	659	4,342	30,390	56	325	176	350,528	3.7
1980	96,217	89	10,044		169,248	3,154	1,016	29,935		300	292	214,078	2.2
1981	83,372		17,011	7	145,214	3,452	684	106,465				272,833	3.3
1982	102,973	196	18,293		290,688	4,574						313,751	3.0
1983	80,343	43	27,150										
1984	100,417	27											
1985	69,026												
1986	88,124												
1987	95,372												
Mean 76-81	79,916	19	15,410	9	188,841	2,357	1,641	46,821	10	196	83	255,386	3.63
SD 76-81	24,022	36	8,050	21	69,112	1,023	1,352	37,069	28	133	117	78,005	2.20
Min 76-81	35,452	24	8,933	7	96,992	659	684	13,097	4	46	30	123,362	1.73
Max 76-81	97,215	89	30,050	45	297,669	3,452	4,342	106,465	56	365	292	350,528	7.88
CV 76-81	0.30	1.89	0.52	2.40	0.37	0.43	0.82	0.79	2.85	0.68	1.41	0.31	0.61

Part B - Percent of brood year return by age class.

1976	0.00	7.24	0.00	78.62	2.33	1.15	10.62	0.00	0.04	0.00	100.0
1977	0.00	3.27	0.00	68.72	0.69	0.34	26.94	0.00	0.05	0.00	100.0
1978	0.01	10.76	0.00	79.89	0.71	0.50	7.99	0.00	0.13	0.01	100.0
1979	0.00	4.81	0.01	84.92	0.19	1.24	8.67	0.02	0.09	0.05	100.0
1980	0.04	4.69	0.00	79.06	1.47	0.47	13.98	0.00	0.14	0.14	100.0
1981	0.00	6.23	0.00	53.22	1.27	0.25	39.02	0.00	0.00	0.00	100.0
Mean 76-81	0.01	6.17	0.00	74.07	1.11	0.66	17.87	0.00	0.07	0.03	100.0
SD 76-81	0.02	2.63	0.01	11.49	0.75	0.43	12.49	0.01	0.06	0.05	0.0
Min 76-81	0.00	3.27	0.00	53.22	0.19	0.25	7.99	0.00	0.00	0.00	100.0
Max 76-81	0.04	10.76	0.01	84.92	2.33	1.24	39.02	0.02	0.14	0.14	100.0
CV 76-81	1.99	0.43	2.00	0.16	0.68	0.65	0.70	2.00	0.74	1.65	0.00

Table 13. Brood year returns and return/spawner of Chilkat Lake sockeye salmon for parent years 1971-1981.

Part A - Numbers of fish by age class.

Brood Year	Escapement	3-Year	4-Year			5-Year			6-Year			7-Year		Total	Return/ Spawner
		1.1	0.3	1.2	2.1	1.3	2.2	3.1	1.4	2.3	3.2	2.4	3.3		
1971	49,342			3,890		21,178	65,584			18,340				108,992	2.2
1972	51,850	0		5,743	1,050	19,708	41,592		0	45,651	693		669	115,106	2.2
1973	50,527	175		2,793		16,232	84,795		0	37,782	165			141,942	2.8
1974	82,811	0		9,715		55,523	98,469		0	35,322	10,160	20	390	209,599	2.5
1975	41,520	0		3,975		9,184	68,309		56	57,075	933	0	896	140,428	3.4
1976	69,729	0		3,053		21,729	50,546		0	97,129	1,799	23	180	174,459	2.5
1977	41,044	0		1,717	83	32,174	69,986		95	103,005	435	83	141	207,719	5.1
1978	67,528	0		3,503	1,550	73,011	69,181		117	51,630	295	57	23	199,367	3.0
1979	80,589	220		6,720	4,478	68,712	88,155		666	119,535	582	79	385	289,532	3.6
1980	95,347	967	41	2,438	1,756	28,755	52,774	125	22	114,318	2,487	95	305	204,083	2.1
1981	84,089	134		1,124	2,229	13,851	56,490		27	41,795	645			116,295	1.4
1982	80,221	444		4,206	470	35,487	36,351								
1983	134,207	0		1,691	1,555										
1984	115,269	711													
1985	57,724	0													
1986	23,947														
1987	48,593														
Mean 71-81	64,943	136	4	4,061	1,013	32,732	67,807	11	89	65,598	1,654	32	272	173,411	2.80
SD 71-81	19,045	298	0	2,482	1,414	22,494	17,303	0	203	35,822	3,002	36	282	55,205	0.97
Min 71-81	41,044	0	41	1,124	83	9,184	41,592	125	0	18,340	165	0	23	108,992	1.38
Max 71-81	95,347	967	41	9,715	4,478	73,011	98,469	125	666	119,535	10,160	95	896	289,532	5.06
CV 71-81	0.29	2.19	0.00	0.61	1.40	0.69	0.26	0.00	2.27	0.55	1.82	1.10	1.04	0.32	0.35

Part B - Percent of brood year return by age class.

1971	0.00	0.00	3.57	0.00	19.43	60.17	0.00	0.00	16.83	0.00	0.00	0.00	100.0
1972	0.00	0.00	4.99	0.91	17.12	36.13	0.00	0.00	39.66	0.60	0.00	0.58	100.0
1973	0.12	0.00	1.97	0.00	11.44	59.74	0.00	0.00	26.62	0.12	0.00	0.00	100.0
1974	0.00	0.00	4.64	0.00	26.49	46.98	0.00	0.00	16.85	4.85	0.01	0.19	100.0
1975	0.00	0.00	2.83	0.00	6.54	48.64	0.00	0.04	40.64	0.66	0.00	0.64	100.0
1976	0.00	0.00	1.75	0.00	12.46	28.97	0.00	0.00	55.67	1.03	0.01	0.10	100.0
1977	0.00	0.00	0.83	0.04	15.49	33.69	0.00	0.05	49.59	0.21	0.04	0.07	100.0
1978	0.00	0.00	1.76	0.78	36.62	34.70	0.00	0.06	25.90	0.15	0.03	0.01	100.0
1979	0.08	0.00	2.32	1.55	23.73	30.45	0.00	0.23	41.29	0.20	0.03	0.13	100.0
1980	0.47	0.02	1.19	0.86	14.09	25.86	0.06	0.01	56.02	1.22	0.05	0.15	100.0
1981	0.12	0.00	0.97	1.92	11.91	48.57	0.00	0.02	35.94	0.55	0.00	0.00	100.0
Mean 71-81	0.07	0.00	2.44	0.55	17.76	41.27	0.01	0.04	36.82	0.87	0.02	0.17	100.0
SD 71-81	0.14	0.01	1.42	0.70	8.47	12.13	0.02	0.07	13.97	1.38	0.02	0.23	0.0
Min 71-81	0.00	0.00	0.83	0.00	6.54	25.86	0.00	0.00	16.83	0.00	0.00	0.00	100.0
Max 71-81	0.47	0.02	4.99	1.92	36.62	60.17	0.06	0.23	56.02	4.85	0.05	0.64	100.0
CV 71-81	1.98	3.32	0.58	1.27	0.48	0.29	3.32	1.82	0.38	1.58	1.18	1.34	0.0

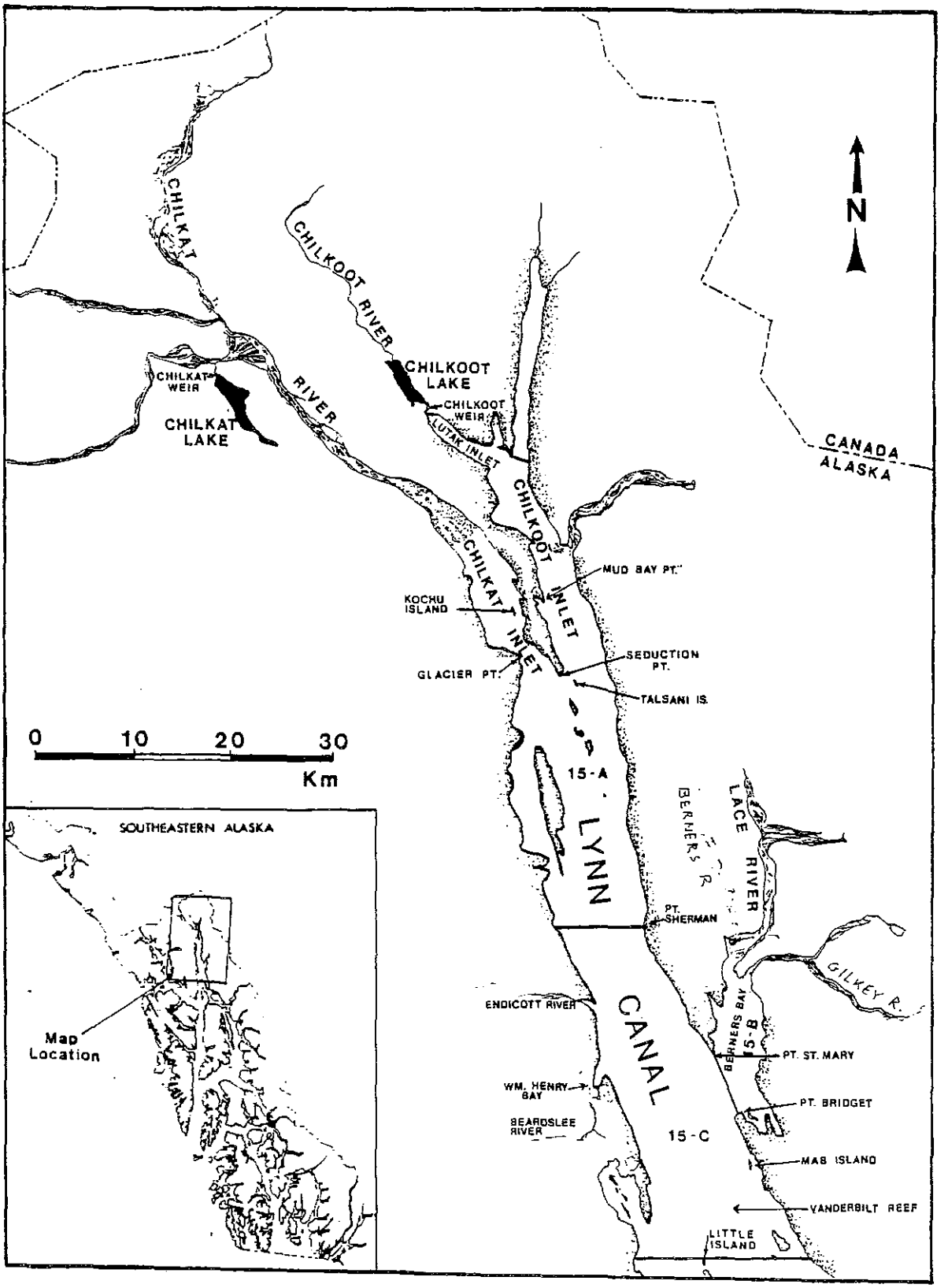


Figure 1. Map of Lynn Canal showing the fishing district and sections (e.g., 15-C) and principal spawning and rearing areas.

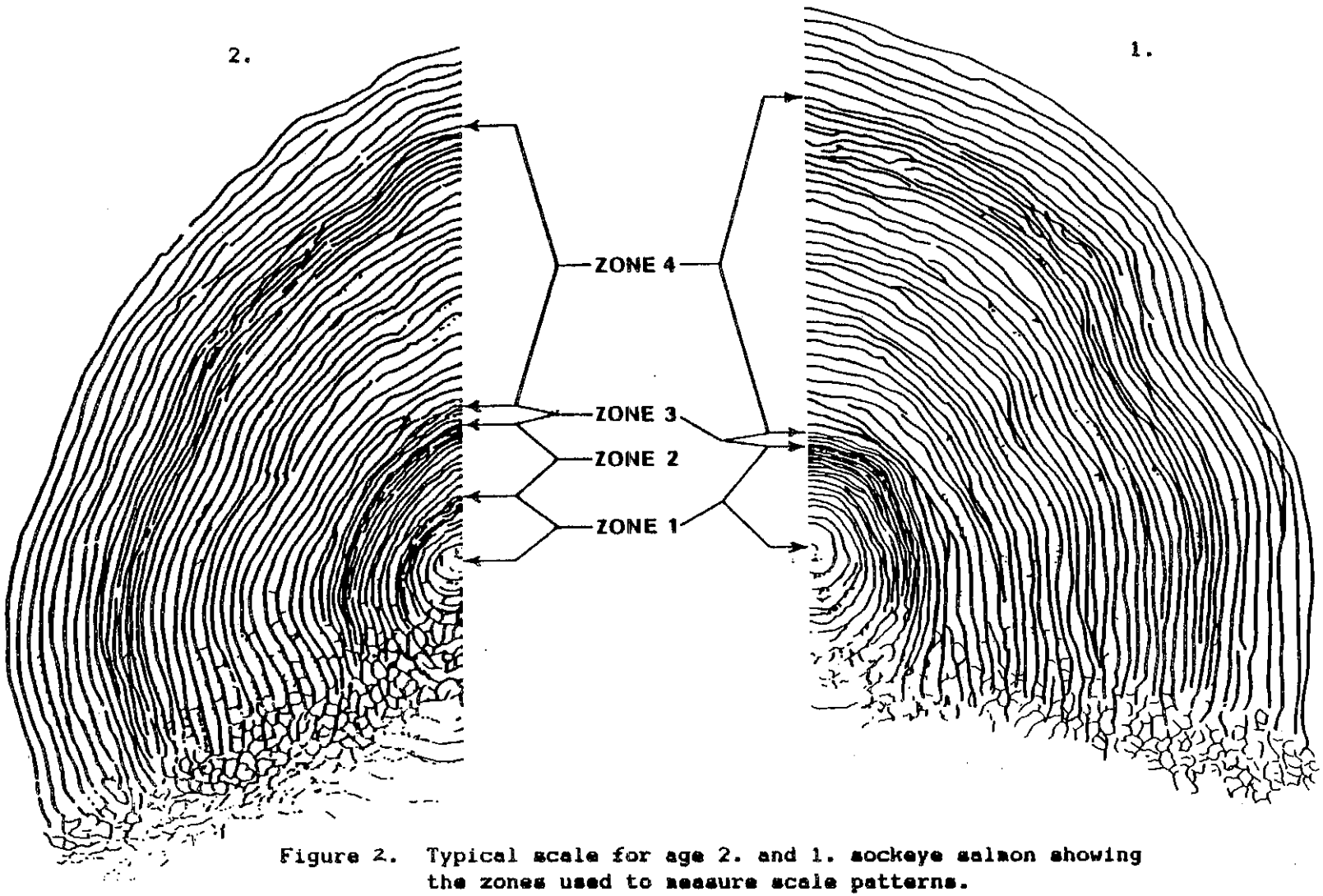


Figure 2. Typical scale for age 2. and 1. sockeye salmon showing the zones used to measure scale patterns.

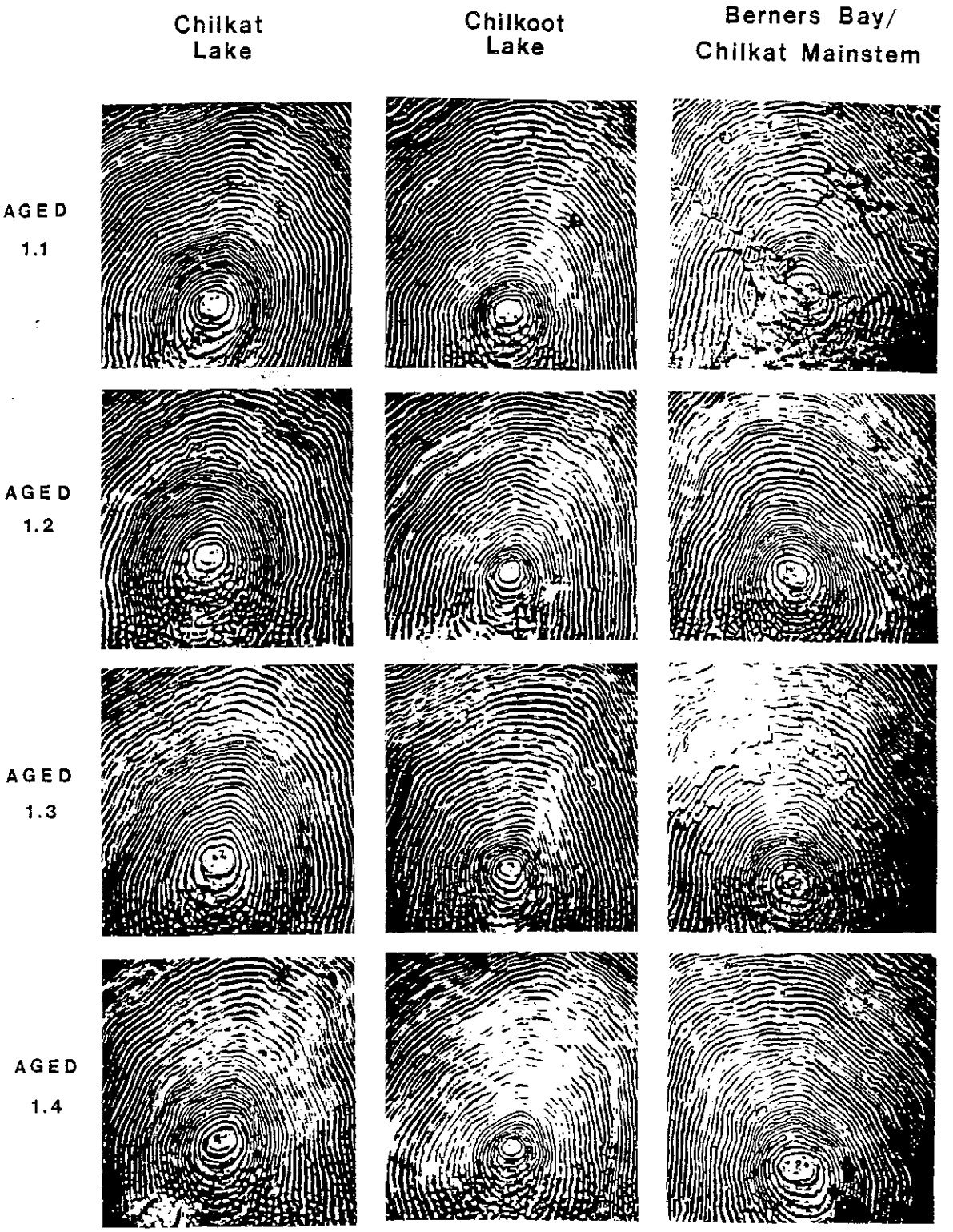


Figure 3. Photographs which illustrate typical scale patterns of sockeye salmon with one freshwater annulus from Chilkoot Lake, Chilkat Lake, and Berners Bay/Chilkat Mainstem stocks.

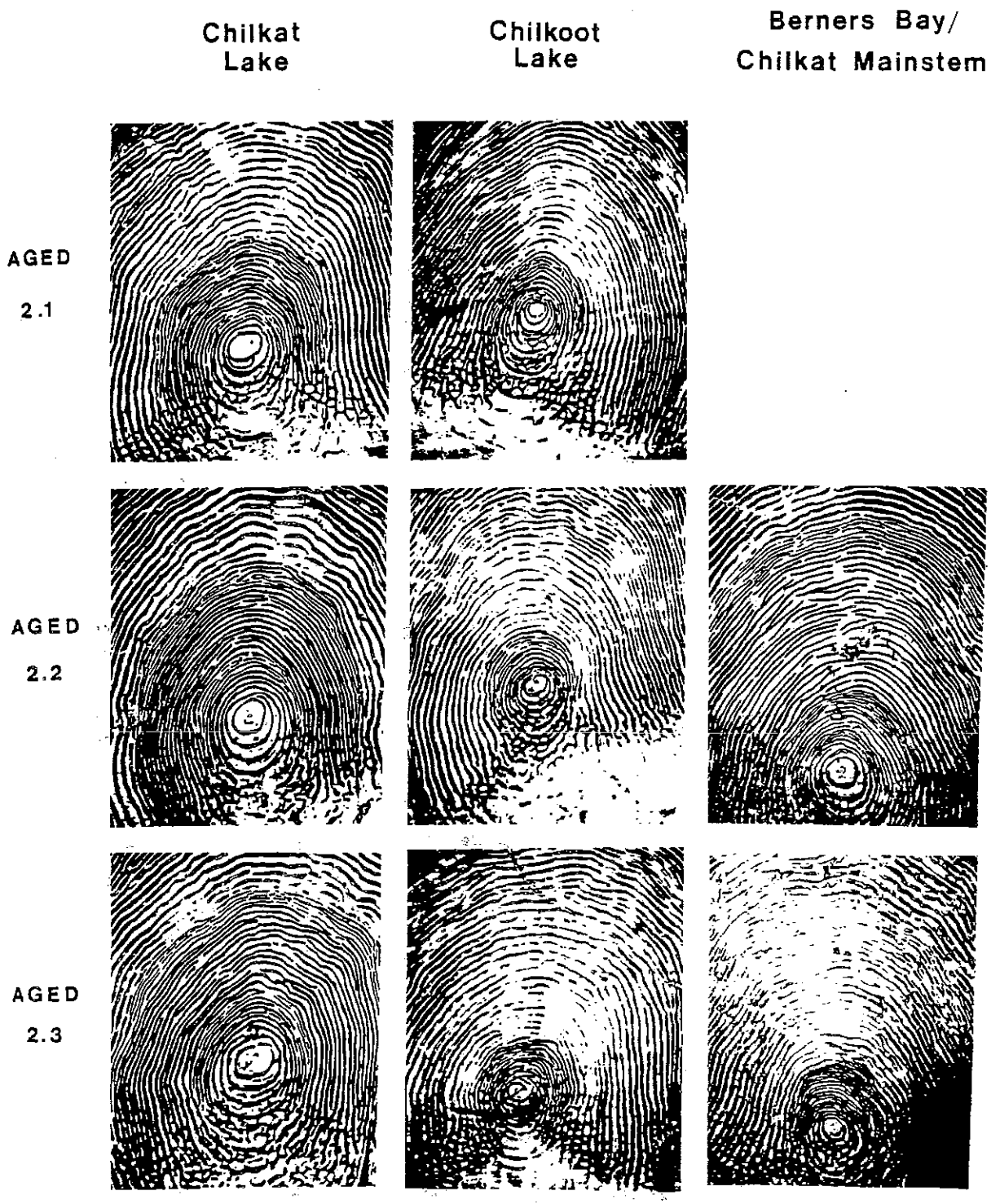


Figure 4. Photographs which illustrate typical scale patterns of sockeye salmon with one freshwater annulus from Chilkoot Lake, Chilkat Lake, and Berners Bay/Chilkat Mainstem stocks.

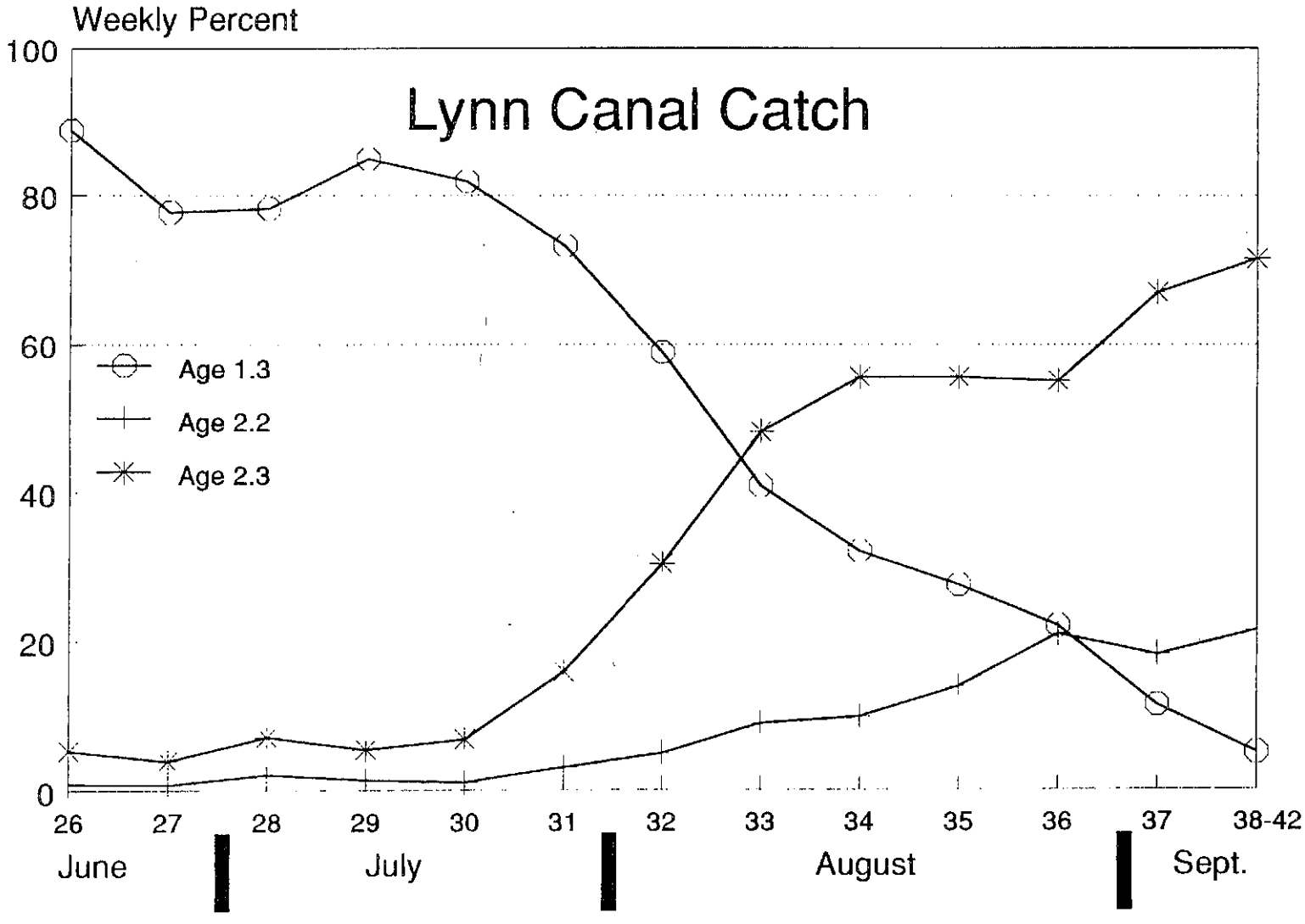


Figure 5. Weekly age composition of sockeye salmon harvested in Lynn Canal, 1987.

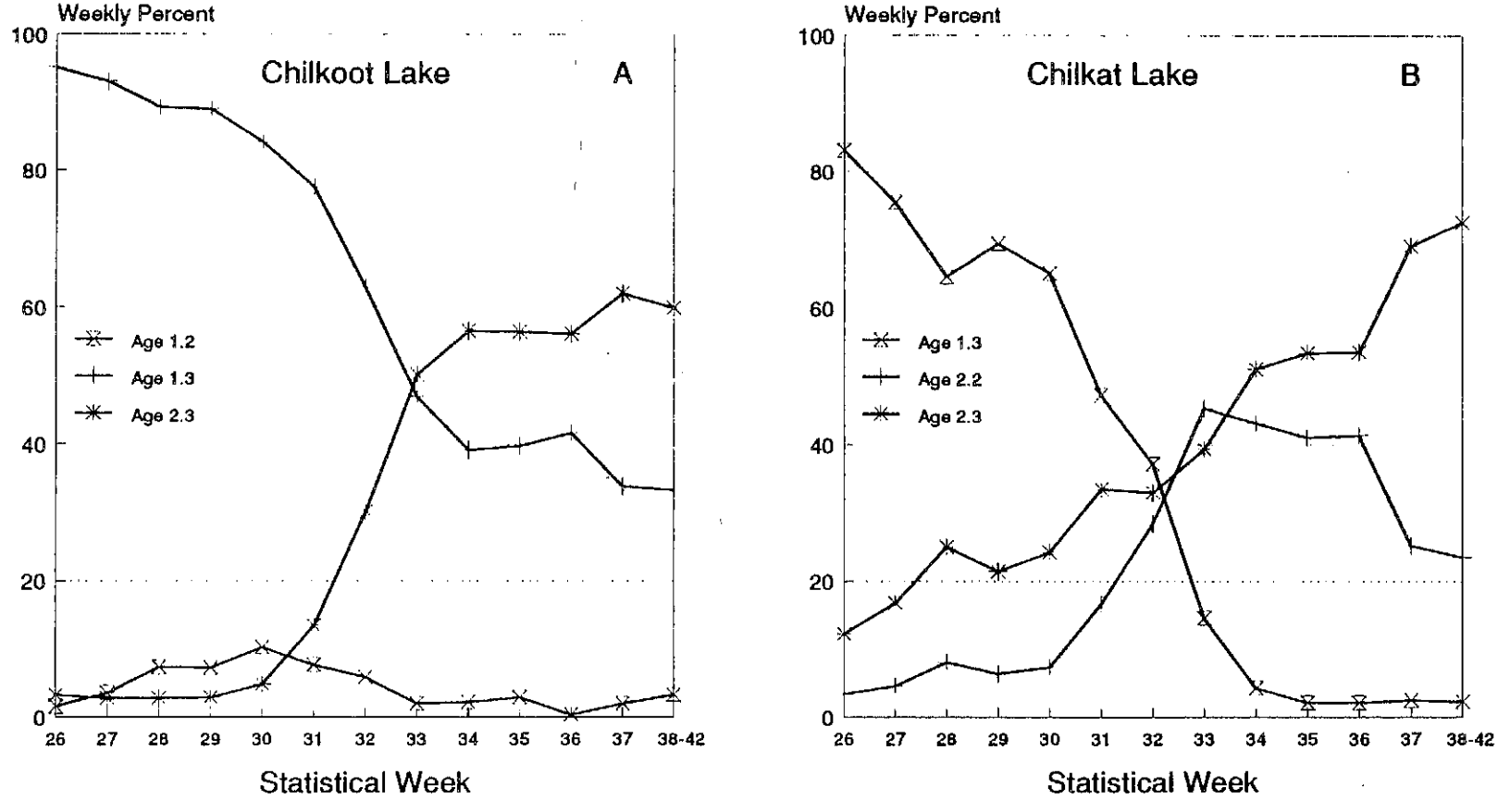


Figure 6. Weely age composition of Chilkoot and Chilkat Lake sockeye salmon harvested in Lynn Canal, 1987.

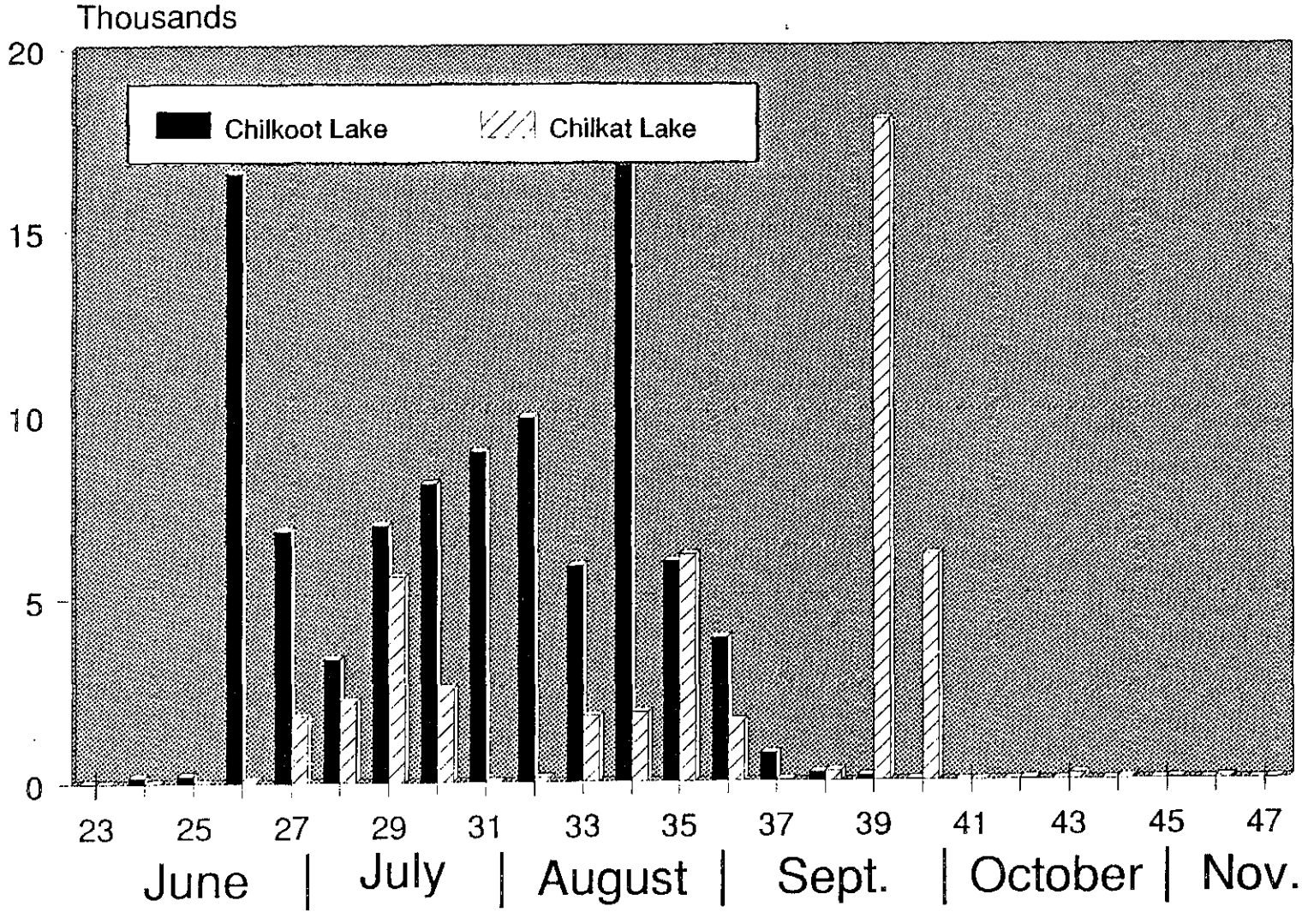


Figure 7. Weekly escapements of sockeye salmon to Chilkoot and Chilkat Lakes, 1987.

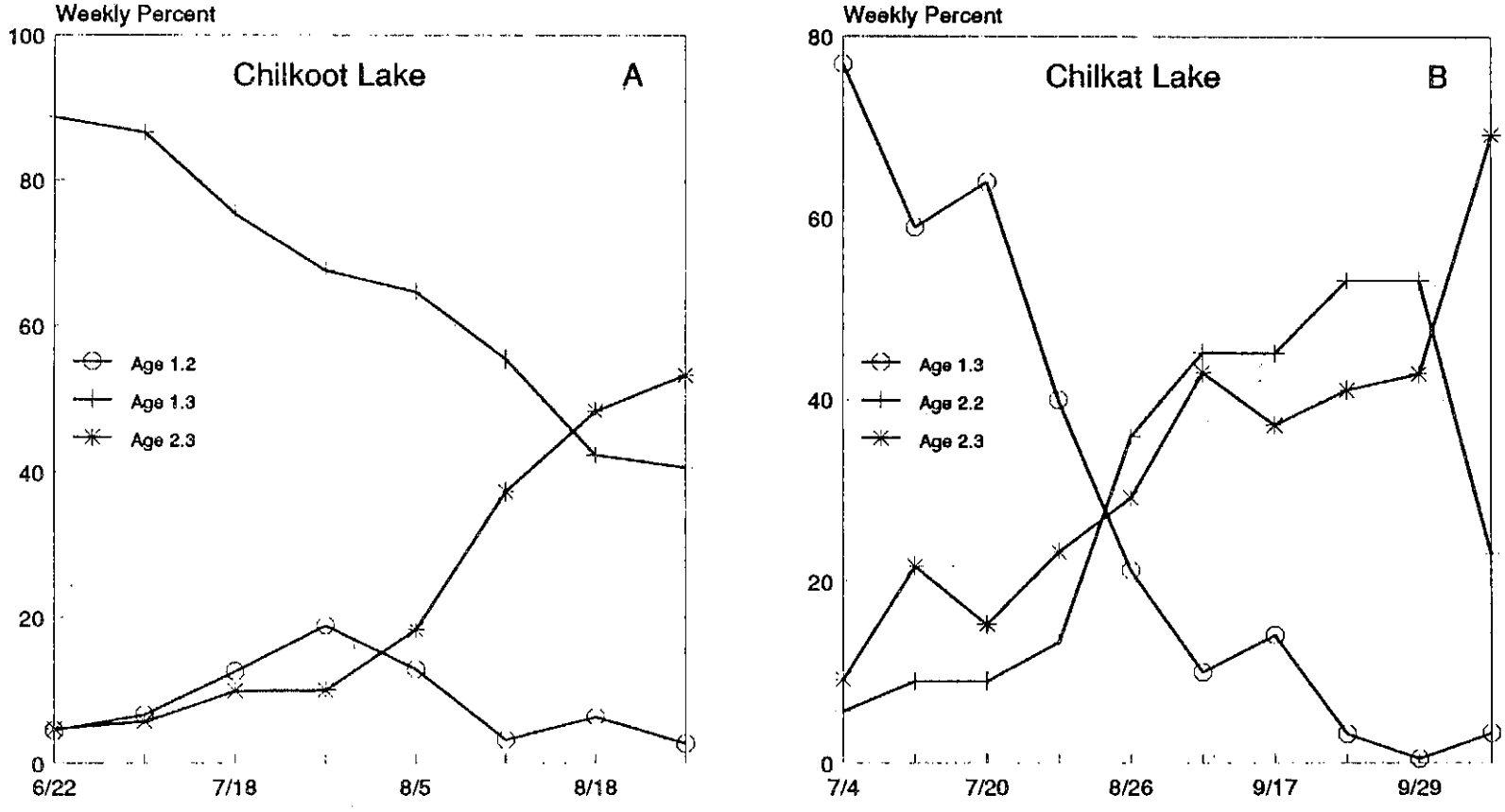


Figure 8. Period age composition of sockeye salmon escapements to Chilkoot and Chilkat Lakes, 1987.

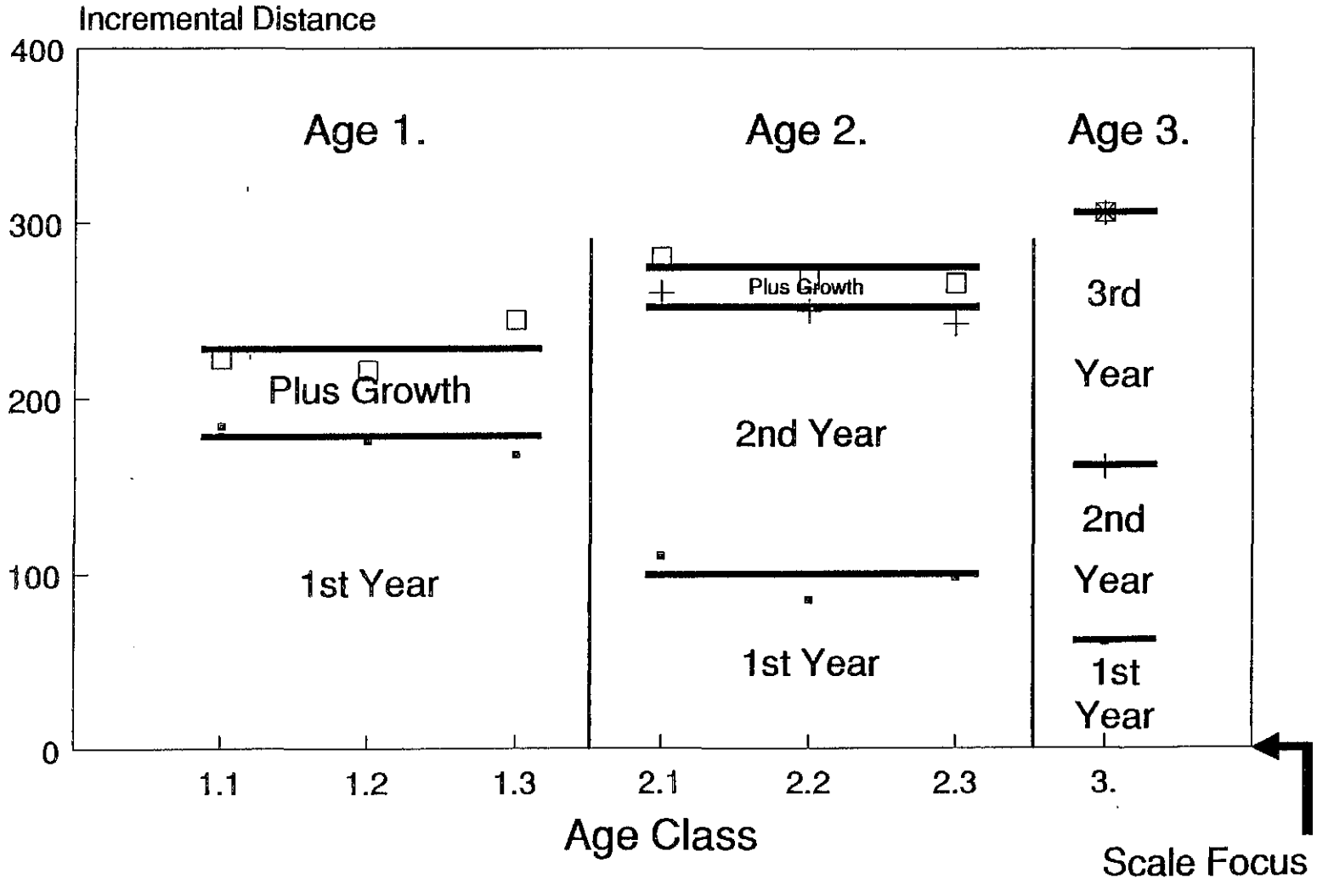


Figure 9. Incremental distances in the freshwater growth zone for Chilkat Lake sockeye salmon aged 1., 2., and 3., 1987. Horizontal bars represent averages across age classes and the uppermost bar represents the incremental distance at smolting.

APPENDICES

Appendix A.1 Scale pattern measurements for age-1.1 sockeye salmon in escapements to Lynn Canal, 1987.

Variable	Stock	Mean	SE	Min	Max
1. Number of circuli in 1st freshwater year.	Chilkat Lake	15.0	0.60	12	18
2. Size of 1st freshwater year.	Chilkat Lake	184.0	7.70	145	220
3. Number of circuli in freshwater plus growth zone.	Chilkat Lake	3.2	0.33	2	5
4. Size of freshwater plus growth zone.	Chilkat Lake	38.9	3.09	23	54
5. Number of circuli in total freshwater growth zone.	Chilkat Lake	18.2	0.51	16	21
6. Size of total freshwater growth zone.	Chilkat Lake	222.9	6.53	190	254
7. Number of circuli in 1st marine year.	Chilkat Lake	23.0	1.01	17	28
8. Size of 1st marine year.	Chilkat Lake	350.6	13.79	256	392
Number of scales digitized.	Chilkat Lake	10			

Appendix A.2. Scale pattern measurements for age-1.2 sockeye salmon in escapements to Lynn Canal, 1987.[a]

Variable	Stock	Mean	SE	Min	Max
1. Number of circuli in 1st freshwater year.	Chilkoot Lake	6.6	0.18	5	10
	Chilkat Lake	14.3	0.75	10	19
	Berners/Mainstem	9.6	0.89	7	14
2. Size of 1st freshwater year.	Chilkoot Lake	61.3	1.63	42	98
	Chilkat Lake	175.8	6.36	144	220
	Berners/Mainstem	94.9	7.08	65	122
3. Number of circuli in freshwater plus growth zone.	Chilkoot Lake	1.6	0.12	1	5
	Chilkat Lake	3.2	0.34	1	7
	Berners/Mainstem	1.1	0.13	1	2
4. Size of freshwater plus growth zone.	Chilkoot Lake	13.1	1.15	5	42
	Chilkat Lake	40.1	4.98	19	106
	Berners/Mainstem	10.1	1.42	5	17
5. Number of circuli in total freshwater growth zone.	Chilkoot Lake	8.2	0.23	6	13
	Chilkat Lake	17.6	0.70	14	22
	Berners/Mainstem	10.8	0.94	8	15
6. Size of total freshwater growth zone	Chilkoot Lake	74.4	2.18	49	126
	Chilkat Lake	215.9	6.92	175	264
	Berners/Mainstem	105	7.49	74	131
7. Number of circuli in 1st marine year.	Chilkoot Lake	31.5	0.47	22	40
	Chilkat Lake	24.1	1.09	16	30
	Berners/Mainstem	32.1	1.88	23	40
8. Size of 1st marine year.	Chilkoot Lake	454.9	7.00	325	567
	Chilkat Lake	359.1	15.57	238	470
	Berners/Mainstem	430.4	19.47	311	484
Number of scales digitized.	Chilkoot Lake	51			
	Chilkat Lake	17			
	Berners/Mainstem	8			

[a] Berners/Mainstem is a combination of scales collected from the Lace River in Berners Bay and from sloughs along the Chilkat River Mainstem.

Appendix A.3. Scale pattern measurements for age-1.3 sockeye salmon in escapements to Lynn Canal, 1987.[a]

Variable	Stock	Mean	SE	Min	Max
1. Number of circuli in 1st freshwater year.	Chilkoot Lake	6.20	0.16	3	12
	Chilkat Lake	14.0	0.26	8	22
	Berners/Mainstem	8.90	0.20	5	16
2. Size of 1st freshwater year.	Chilkoot Lake	54.4	1.25	27	96
	Chilkat Lake	167.7	2.48	110	278
	Berners/Mainstem	92.4	2.11	55	151
3. Number of circuli in freshwater plus growth zone.	Chilkoot Lake	1.4	0.05	1	3
	Chilkat Lake	6.6	0.21	2	12
	Berners/Mainstem	2.1	0.16	1	9
4. Size of freshwater plus growth zone.	Chilkoot Lake	10.8	0.42	5	26
	Chilkat Lake	76.8	2.59	16	148
	Berners/Mainstem	17.4	1.42	5	80
5. Number of circuli in total freshwater growth zone.	Chilkoot Lake	7.60	0.16	5	14
	Chilkat Lake	20.6	0.27	13	27
	Berners/Mainstem	11.0	0.24	6	19
6. Size of total freshwater growth zone	Chilkoot Lake	65.1	1.30	41	111
	Chilkat Lake	244.5	3.02	148	328
	Berners/Mainstem	109.8	2.36	62	175
7. Number of circuli in 1st marine year.	Chilkoot Lake	33.4	0.31	26	40
	Chilkat Lake	25.9	0.36	15	35
	Berners/Mainstem	32.1	0.34	23	40
8. Size of 1st marine year.	Chilkoot Lake	470.6	4.53	346	574
	Chilkat Lake	367.4	4.73	256	484
	Berners/Mainstem	427.4	5.33	295	580
Number of scales digitized.	Chilkoot Lake	103			
	Chilkat Lake	98			
	Berners/Mainstem	101			

[a] Berners/Mainstem is a combination of scales collected from the Lace River in Berners Bay and from sloughs along the Chilkat River Mainstem

Appendix A.4 Scale pattern measurements for age-2.1 sockeye salmon in escapements to Lynn Canal, 1987.

Variable	Stock	Mean	SE	Min	Max
1. Number of circuli in 1st freshwater year.	Chilkat Lake	8.5	0.44	6	13
2. Size of 1st freshwater year.	Chilkat Lake	109.6	4.50	78	154
3. Number of circuli in 2nd freshwater year.	Chilkat Lake	14.4	0.32	11	17
4. Size of 2nd freshwater year.	Chilkat Lake	150.5	5.12	102	189
5. Number of circuli in freshwater plus growth zone.	Chilkat Lake	1.7	0.21	1	4
6. Size of freshwater plus growth zone.	Chilkat Lake	21.3	2.75	8	53
7. Number of circuli in 1st two freshwater years.	Chilkat Lake	22.9	0.38	21	27
8. Size of first two freshwater years.	Chilkat Lake	260.1	5.52	228	309
9. Number of circuli in total freshwater growth zone.	Chilkat Lake	24.6	0.34	22	28
10. Size of total freshwater growth zone.	Chilkat Lake	281.4	5.61	241	324
11. Number of circuli in 1st marine year.	Chilkat Lake	23.0	0.49	18	27
12. Size of 1st marine year.	Chilkat Lake	352.1	7.99	289	422
Number of scales digitized.	Chilkat Lake	19			

Appendix A.5. Scale pattern measurements for age-2.2 sockeye salmon in escapements to Lynn Canal, 1987.

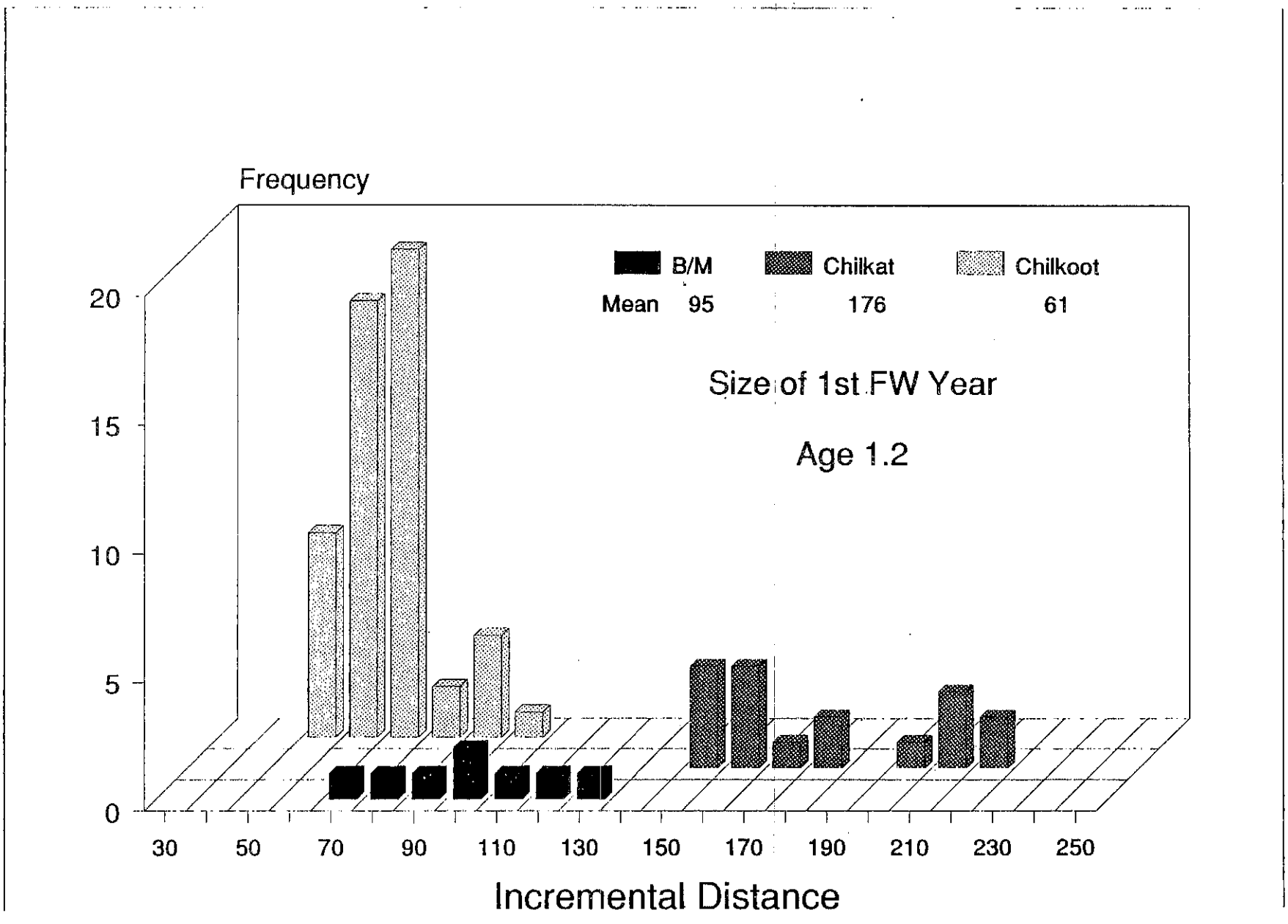
Variable	Stock	Mean	SE	Min	Max
1. Number of circuli in 1st freshwater year.	Chilkoot Lake	4.9	0.19	3	7
	Chilkat Lake	6.9	0.25	4	11
2. Size of 1st freshwater year.	Chilkoot Lake	39.7	1.18	25	52
	Chilkat Lake	85.0	3.55	44	146
3. Number of circuli in 2nd freshwater year.	Chilkoot Lake	7.4	0.26	5	12
	Chilkat Lake	15.8	0.23	11	19
4. Size of 2nd freshwater year.	Chilkoot Lake	58.3	2.61	29	103
	Chilkat Lake	164.6	2.73	111	205
5. Number of circuli in freshwater plus growth zone.	Chilkoot Lake	1.6	0.14	1	4
	Chilkat Lake	1.6	0.10	1	3
6. Size of freshwater plus growth zone.	Chilkoot Lake	14.8	1.24	6	31
	Chilkat Lake	18.1	1.07	8	36
7. Number of circuli in 1st two freshwater years.	Chilkoot Lake	12.3	0.30	10	18
	Chilkat Lake	22.7	0.28	18	28
8. Size of first two freshwater years.	Chilkoot Lake	97.8	3.05	62	145
	Chilkat Lake	249.5	4.25	187	312
9. Number of circuli in total freshwater growth zone.	Chilkoot Lake	13.9	0.30	12	19
	Chilkat Lake	24.4	0.29	19	30
10. Size of total freshwater growth zone.	Chilkoot Lake	112.6	3.31	72	158
	Chilkat Lake	267.7	4.33	205	339
11. Number of circuli in 1st marine year.	Chilkoot Lake	29.6	0.58	23	38
	Chilkat Lake	24.3	0.39	20	30
12. Size of 1st marine year.	Chilkoot Lake	445.6	8.01	353	566
	Chilkat Lake	377.9	6.53	287	481
Number of scales digitized.	Chilkoot Lake	30			
	Chilkat Lake	50			

Appendix A.6. Scale pattern measurements for age-2.3 sockeye salmon in escapements to Lynn Canal, 1987.

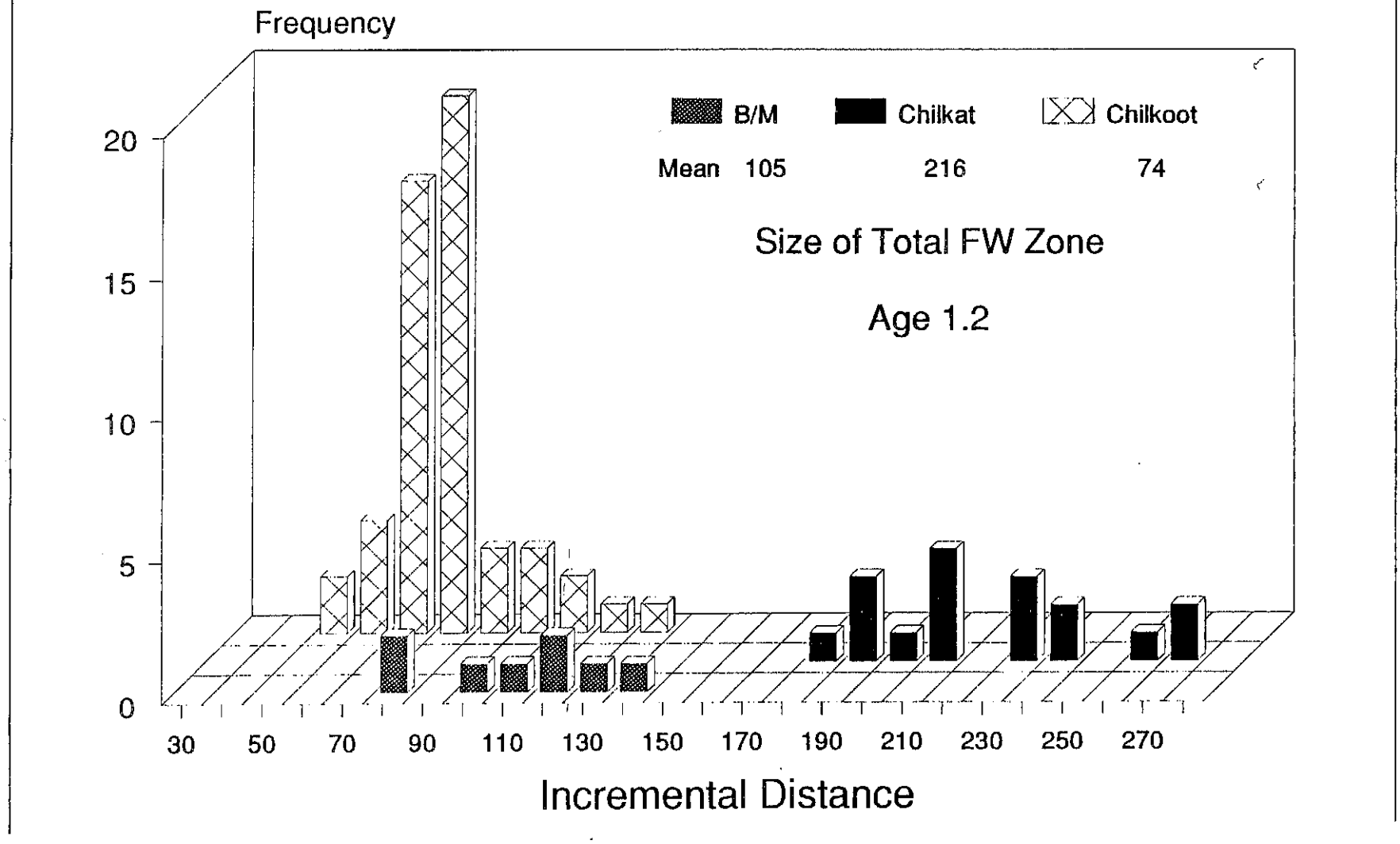
Variable	Stock	Mean	SE	Min	Max
1. Number of circuli in 1st freshwater year.	Chilkoot Lake	4.5	0.20	3	7
	Chilkat Lake	7.6	0.30	3	12
2. Size of 1st freshwater year.	Chilkoot Lake	38.8	1.65	23	56
	Chilkat Lake	98.0	3.23	49	140
3. Number of circuli in 2nd freshwater year.	Chilkoot Lake	5.5	0.26	4	8
	Chilkat Lake	13.9	0.33	9	22
4. Size of 2nd freshwater year.	Chilkoot Lake	37.4	2.04	19	63
	Chilkat Lake	145.4	3.38	107	206
5. Number of circuli in freshwater plus growth zone.	Chilkoot Lake	1.4	0.10	1	2
	Chilkat Lake	2.1	0.15	1	5
6. Size of freshwater plus growth zone.	Chilkoot Lake	10.8	0.85	6	21
	Chilkat Lake	22.1	1.68	6	52
7. Number of circuli in 1st two freshwater years.	Chilkoot Lake	10.0	0.31	8	13
	Chilkat Lake	21.5	0.40	17	31
8. Size of first two freshwater years.	Chilkoot Lake	76.2	2.79	55	111
	Chilkat Lake	243.3	4.43	192	313
9. Number of circuli in total freshwater growth zone.	Chilkoot Lake	11.4	0.33	9	14
	Chilkat Lake	23.6	0.40	18	32
10. Size of total freshwater growth zone.	Chilkoot Lake	87.0	2.92	62	118
	Chilkat Lake	265.5	4.43	199	335
11. Number of circuli in 1st marine yeaf.	Chilkoot Lake	31.6	0.75	25	38
	Chilkat Lake	26.9	0.52	21	35
12. Size of 1st marine year.	Chilkoot Lake	446.8	10.55	350	575
	Chilkat Lake	407.6	8.81	294	563
Number of scales digitized.	Chilkoot Lake	24			
	Chilkat Lake	50			

Appendix A.7 Scale pattern measurements for age-3.2 and -3.3 sockeye salmon in escapements to Lynn Canal, 1987.

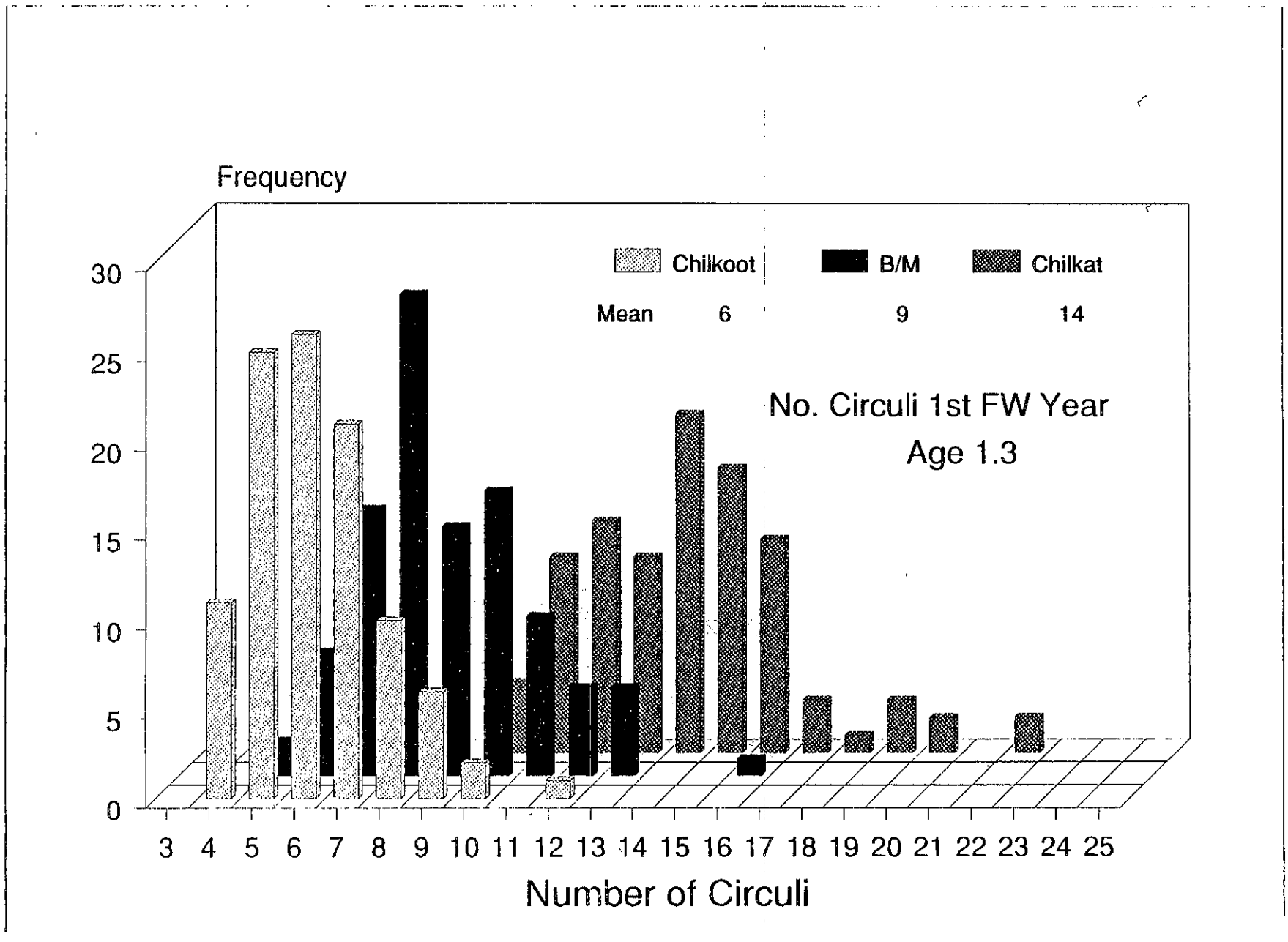
Variable	Stock	Mean	SE	Min	Max
1. Number of circuli in 1st freshwater year.	Chilkat Lake	5.4	0.61	3	8
2. Size of 1st freshwater year.	Chilkat Lake	61.3	6.03	48	94
3. Number of circuli in 2nd freshwater year.	Chilkat Lake	10.7	0.97	8	13
4. Size of 2nd freshwater year.	Chilkat Lake	99.7	9.46	72	131
5. Number of circuli in 3rd freshwater year.	Chilkat Lake	13.4	0.92	9	16
6. Size of 3rd freshwater year.	Chilkat Lake	145.1	14.34	86	192
7. Number of circuli in total freshwater growth zone.	Chilkat Lake	29.6	1.46	23	34
8. Size of circuli in total freshwater growth zone.	Chilkat Lake	306.1	20.23	228	372
9. Number of circuli in 1st marine year.	Chilkat Lake	24.4	1.31	20	30
10. Size of 1st marine year.	Chilkat Lake	378.4	14.83	336	440
Number of scales digitized.	Chilkat Lake	7			



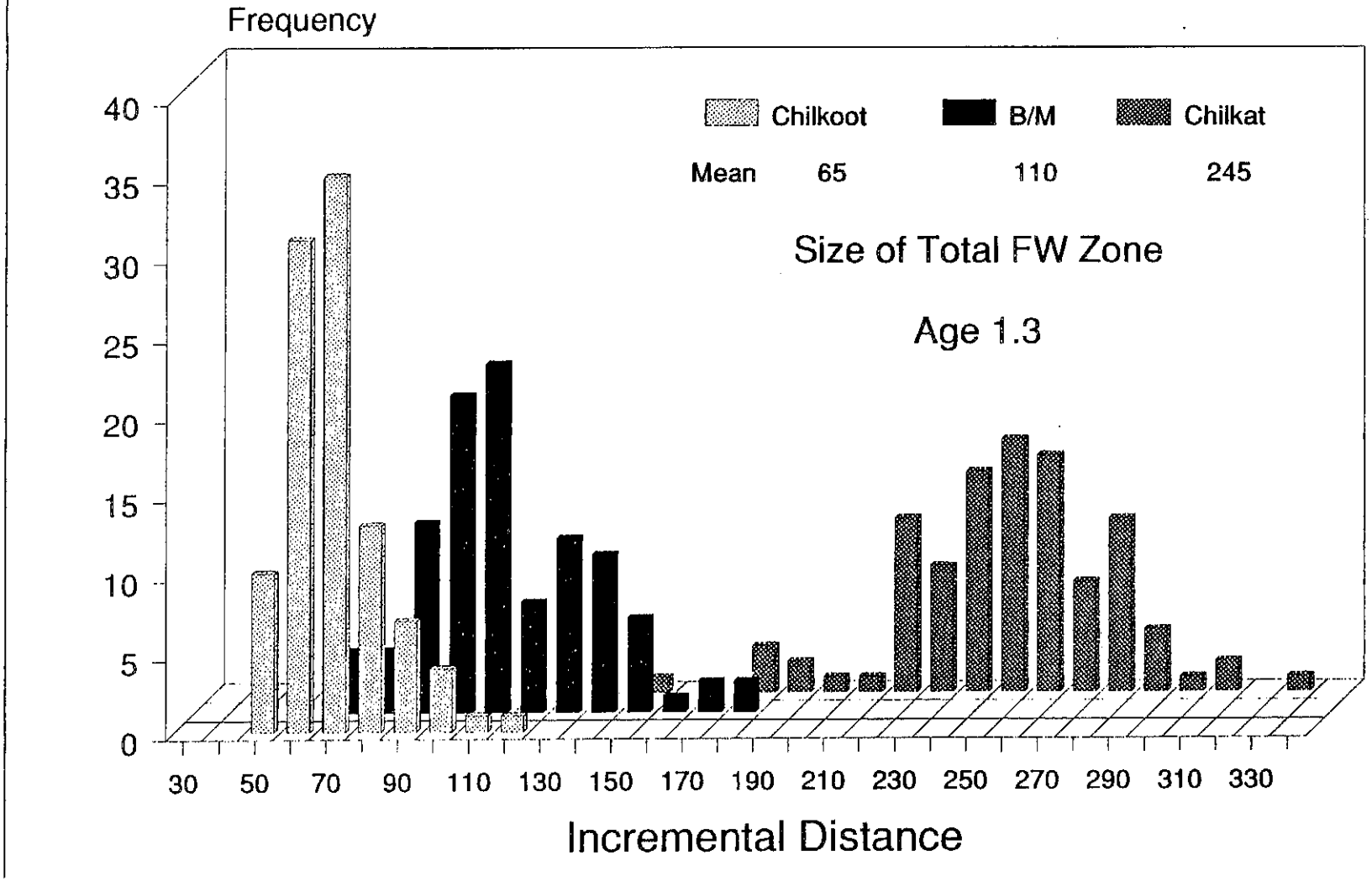
Appendix A.8. Incremental distances in the first freshwater year for fish aged 1.2 in Chilkoot Lake, Chilkat Lake, and Berners Bay/Chilkat Mainstem (BM) escapements, 1987.



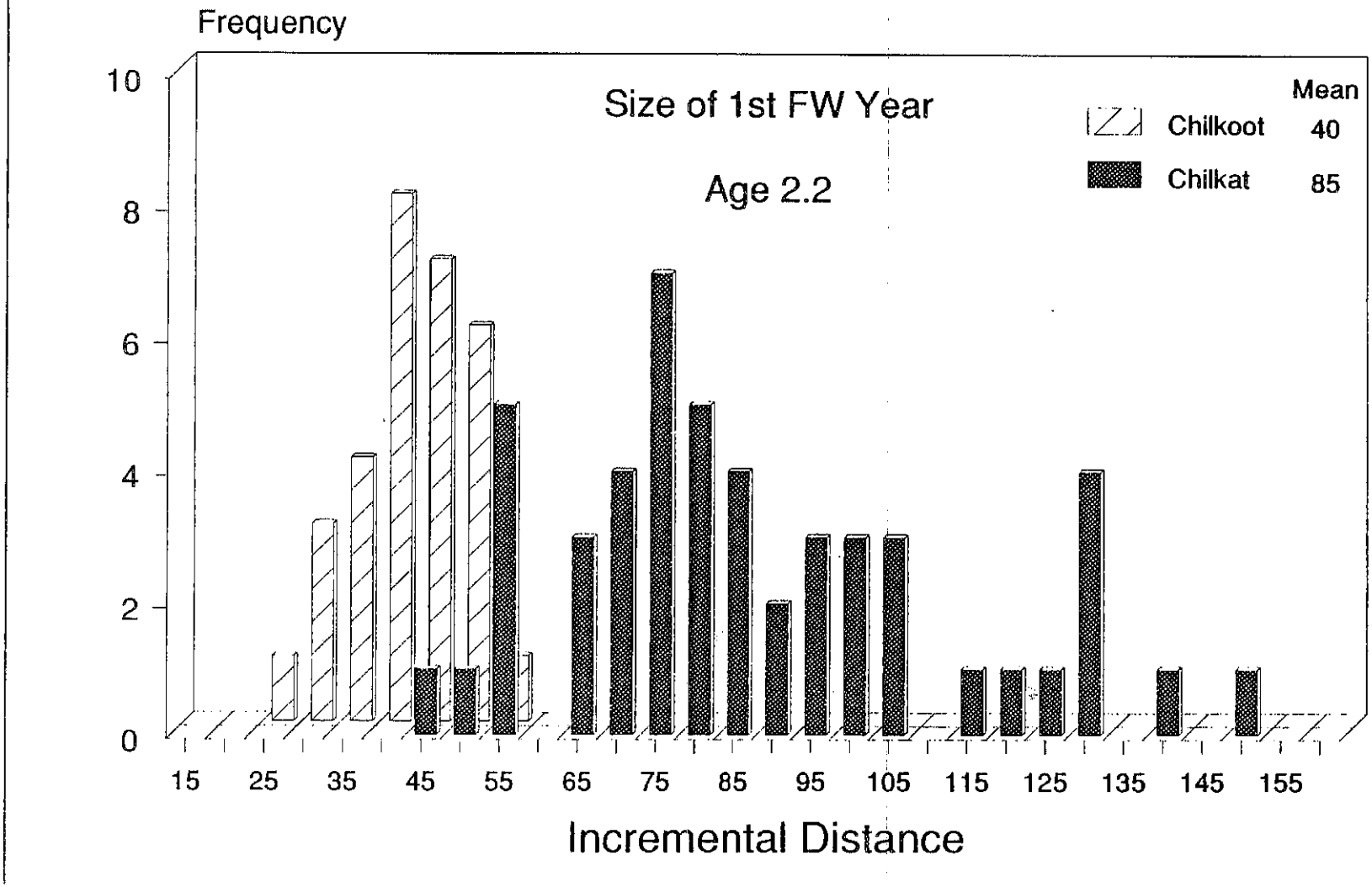
Appendix A.9. Incremental distances in the total freshwater zone for fish aged 1.2 in Chilkoot Lake, Chilkat Lake, and Berners Bay/Chilkat Mainstem (BM) escapements, 1987.



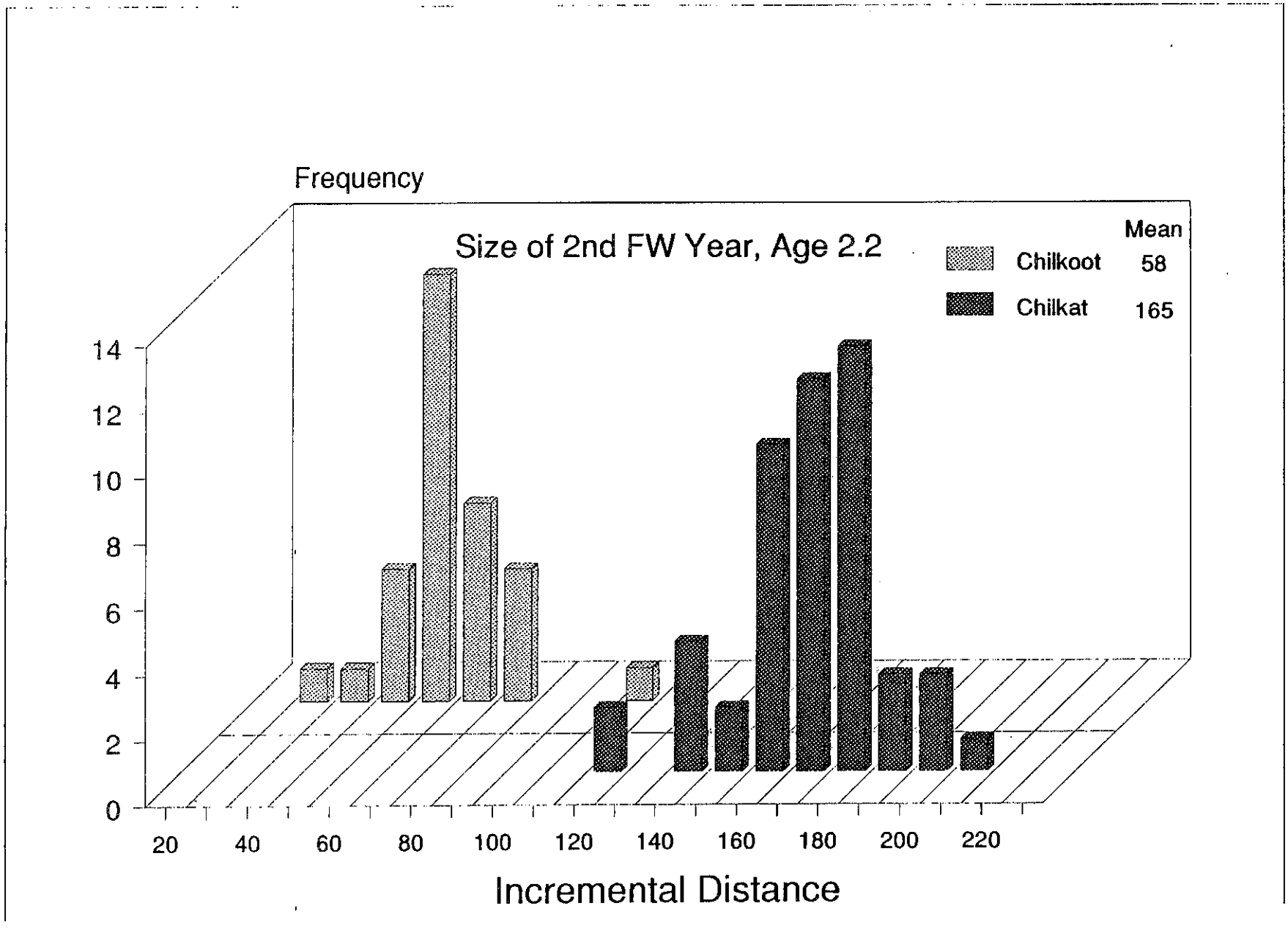
Appendix A.10. Number of circuli in the first freshwater year for fish aged 1.3 in Chilkoot Lake, Chilkat Lake, and Berners Bay/Chilkat Mainstem (BM) escapements, 1987.



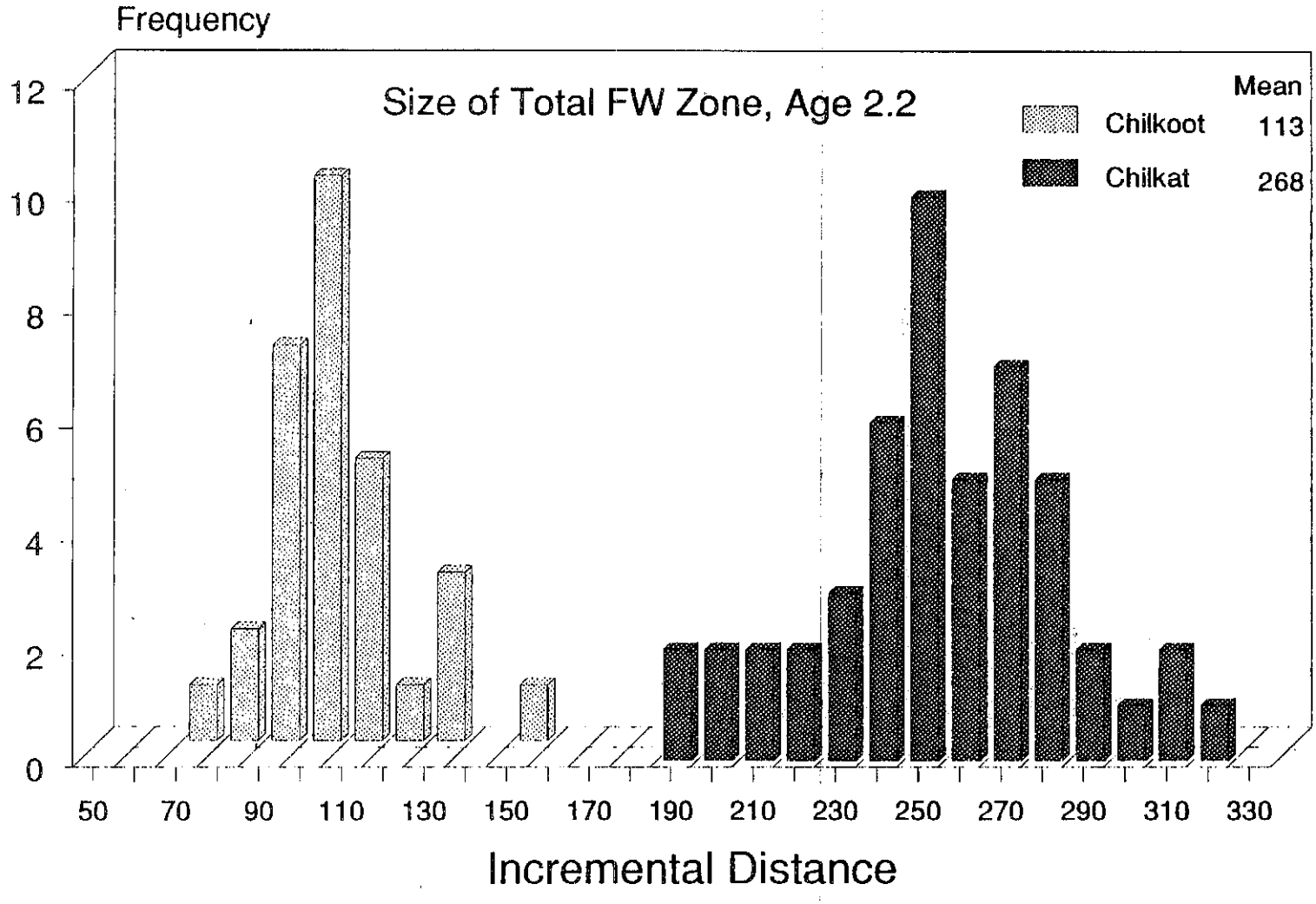
Appendix A.11. Incremental distances in the total freshwater zone for fish aged 1.3 in Chilkoot Lake, Chilkat Lake, and Berners Bay/Chilkat Mainstem (BM) escapements, 1987.



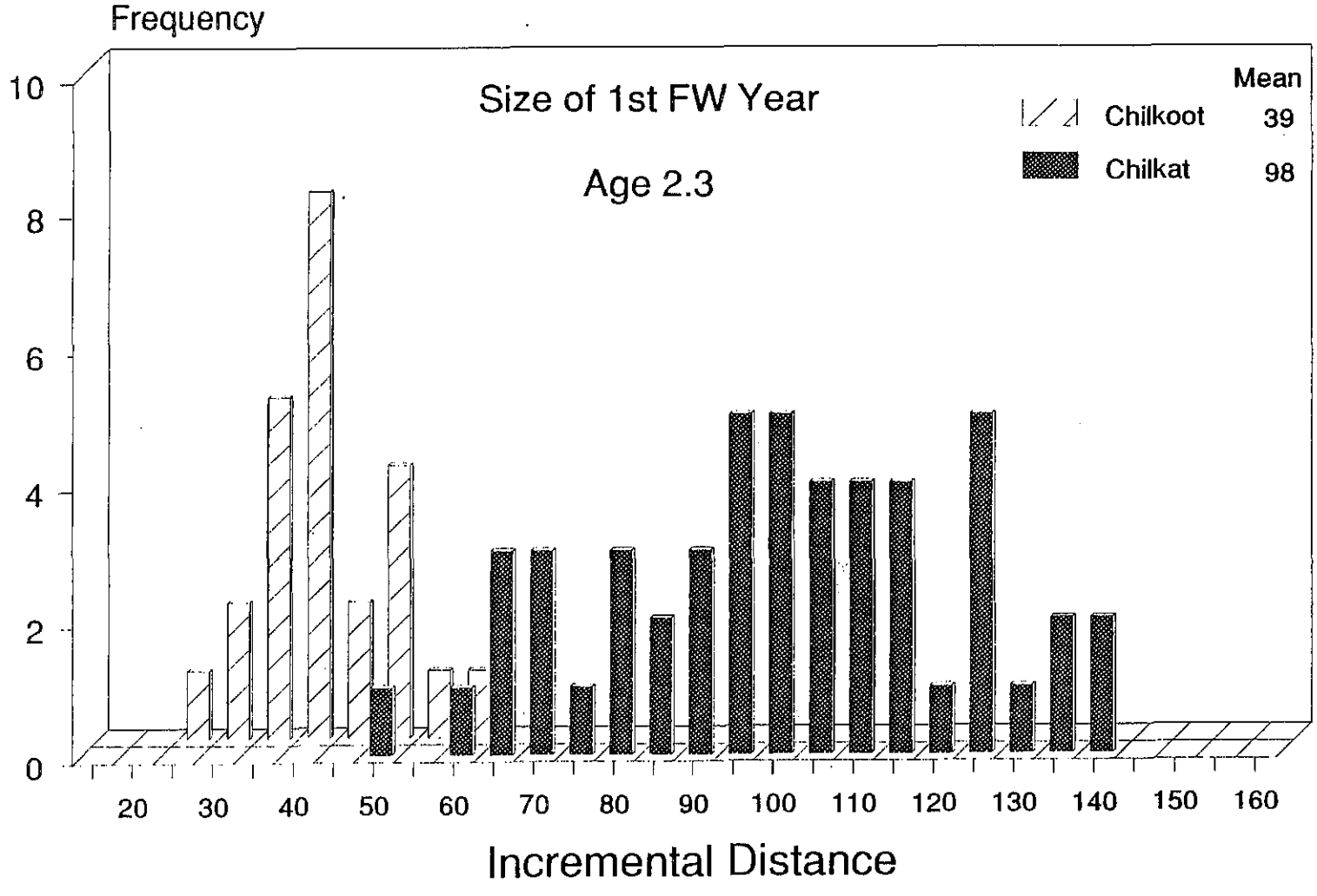
Appendix A.12. Incremental distances in the first freshwater year for fish aged 2.2 in Chilkoot and Chilkat Lake escapements, 1987.



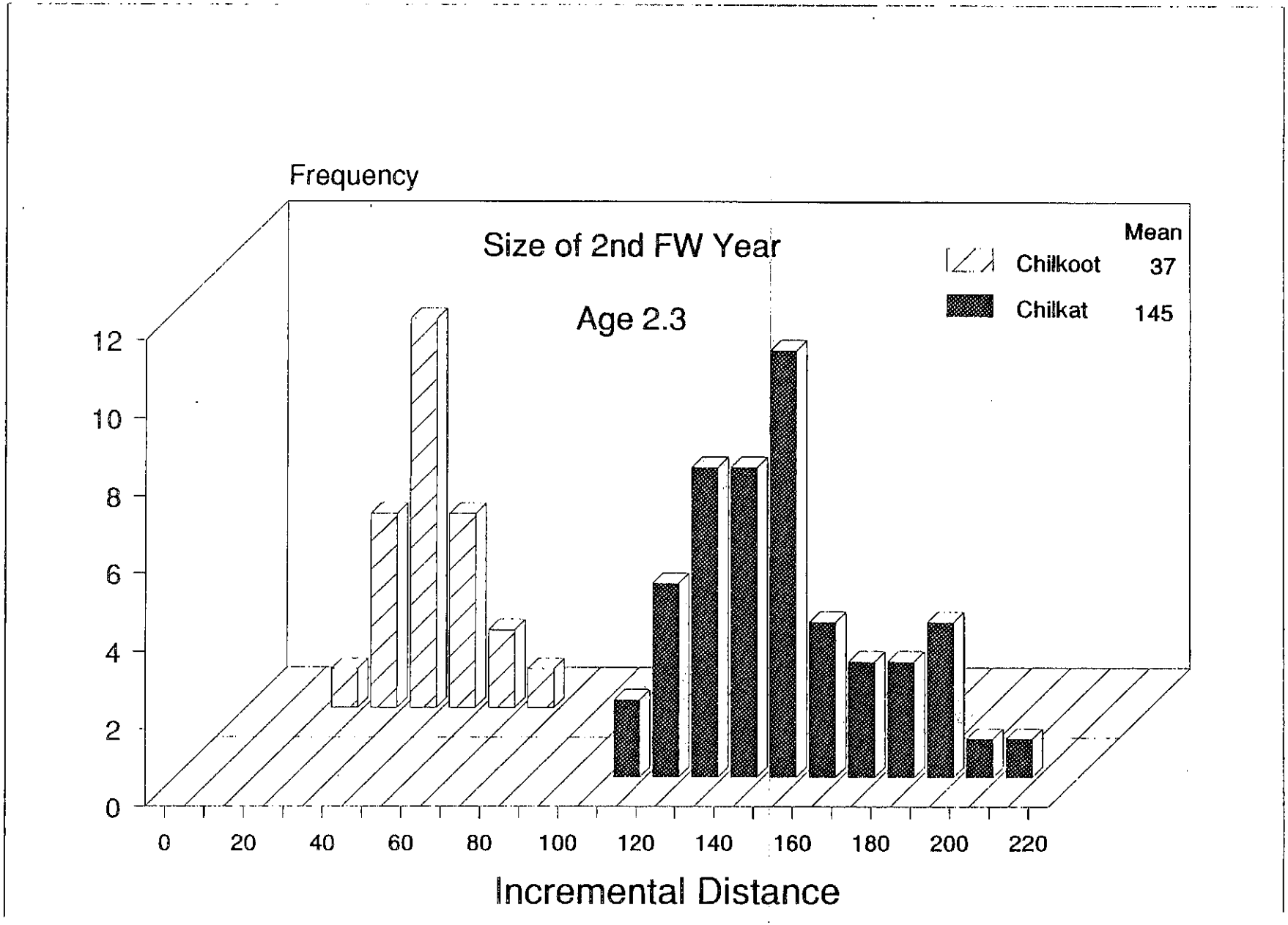
Appendix A.13. Incremental distances in the second freshwater year for fish aged 2.2 in Chilkoot and Chilkat Lake escapements, 1987.



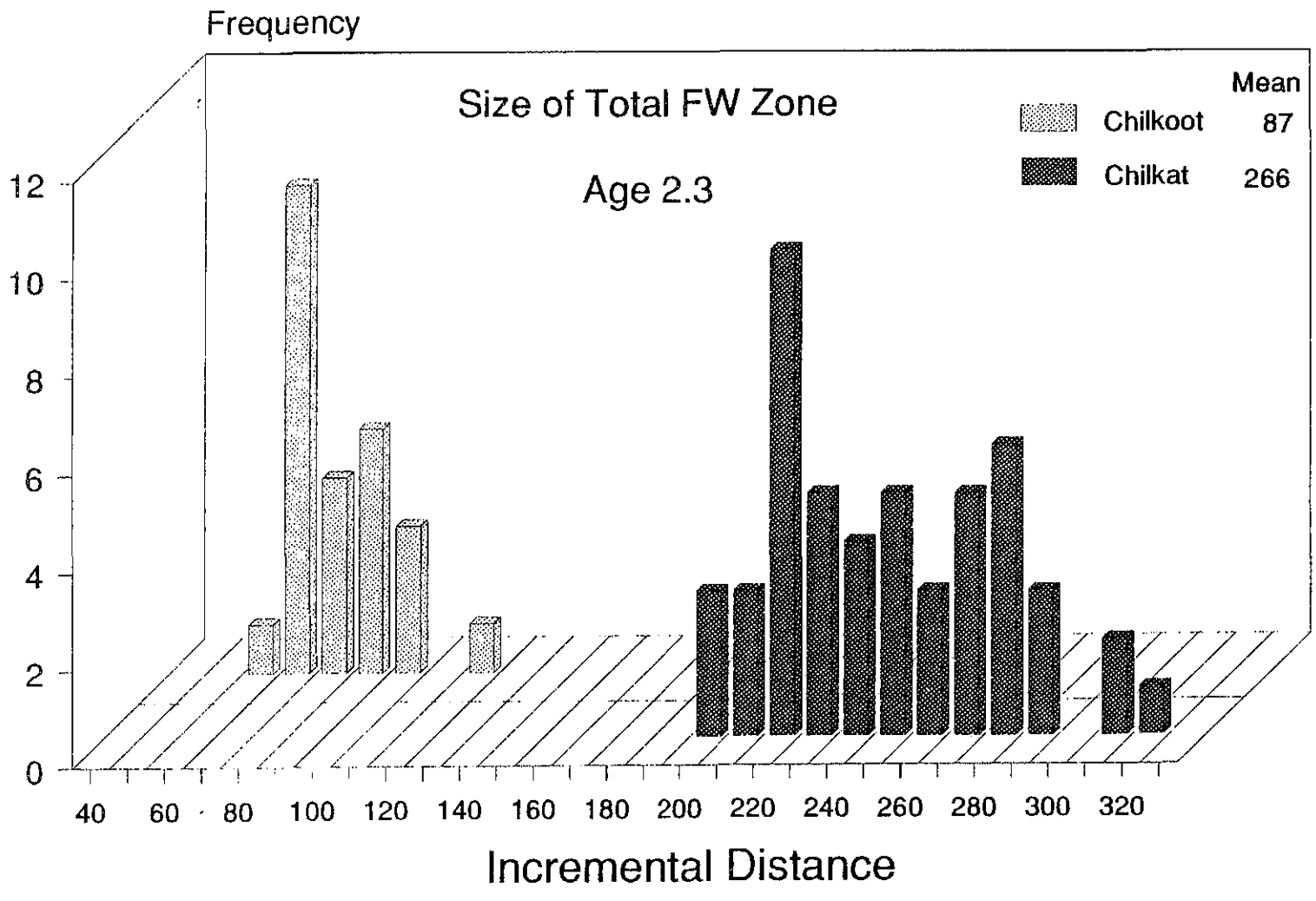
Appendix A.14. Incremental distances in the total freshwater zone for fish aged 2.2 in Chilkoot and Chilkat Lake escapements, 1987.



Appendix A.15. Incremental distances in the first freshwater year for fish aged 2.3 in Chilkoot and Chilkat Lake escapements, 1987.



Appendix A.16. Incremental distances in the second freshwater year for fish aged 2.3 in Chilkoot and Chilkat Lake escapements, 1987.



Appendix A.17. Incremental distances in the total freshwater zone for fish aged 2.3 in Chilkoot and Chilkat Lake escapements, 1987.

Appendix B.1. Age composition of sockeye salmon in the Lynn Canal (District 115) gill net catch by age class and fishing period, 1987.

	Brood Year and Age Class												
	1984		1983		1982			1981			1980		
	0.2	1.1	0.3	1.2	0.4	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total
Statistical Week 26 (June 21 - 27)													
Sample Number	1		29	17		835	8		50				940
Percent	0.1		3.1	1.8		88.8	0.9		5.3				100.0
Std. Error	0.1		0.5	0.4		1.0	0.3		0.7				
Number	8		230	135		6620	63		396				7452
Statistical Week 27 (June 28 - July 4)													
Sample Number		1	135	39		775	8	1	39				998
Percent		0.1	13.5	3.9		77.7	0.8	0.1	3.9				100.0
Std. Error		0.1	1.1	0.6		1.3	0.3	0.1	0.6				
Number		27	3628	1048		20827	215	27	1048				26820
Statistical Week 28 (July 5 - 11)													
Sample Number			57	52	2	684	18		62				875
Percent			6.5	5.9	0.2	78.2	2.1		7.1				100.0
Std. Error			0.8	0.7	0.2	1.3	0.4		0.8				
Number			466	425	16	5596	148		508				7159
Statistical Week 29 (July 12 - 18)													
Sample Number	1		16	71		911	15	1	58				1073
Percent	0.1		1.5	6.6		84.9	1.4	0.1	5.4				100.0
Std. Error	0.1		0.4	0.8		1.1	0.4	0.1	0.7				
Number	48		776	3441		44159	727	48	2811				52010
Statistical Week 30 (July 19 - 25)													
Sample Number			4	92		788	11	1	65	1			962
Percent			0.4	9.6		81.9	1.1	0.1	6.8	0.1			100.0
Std. Error			0.2	0.9		1.2	0.3	0.1	0.8	0.1			
Number			214	4911		42069	587	53	3470	53			51357
Statistical Week 31 (July 26 - August 1)													
Sample Number			6	71		736	31	1	160				1005
Percent			0.6	7.1		73.2	3.1	0.1	15.9				100.0
Std. Error			0.2	0.8		1.4	0.5	0.1	1.1				
Number			289	3422		35479	1494	48	7712				48444
Statistical Week 32 (August 2 - 8)													
Sample Number			4	74		854	71	3	441		2	1	1450
Percent			0.3	5.1		58.9	4.9	0.2	30.4		0.1	0.1	100.0
Std. Error			0.1	0.6		1.3	0.6	0.1	1.2		0.1	0.1	
Number			280	5186		59856	4976	210	30909		140	70	101627
Statistical Week 33 (August 9 - 15)													
Sample Number			2	15		374	81		440			3	915
Percent			0.2	1.6		40.9	8.9		48.1			0.3	100.0
Std. Error			0.2	0.4		1.6	0.9		1.6			0.2	
Number			111	836		20848	4515		24527			167	51004
Statistical Week 34 (August 16 - 22)													
Sample Number			1	19	1	341	104	1	589	2	2	2	1062
Percent			0.1	1.8	0.1	32.1	9.8	0.1	55.5	0.2	0.2	0.2	100.0
Std. Error			0.1	0.4	0.1	1.4	0.9	0.1	1.5	0.1	0.1	0.1	
Number			38	728	38	13059	3983	38	22557	77	76	76	40670
Statistical Week 35 (August 23 - 29)													
Sample Number				19		243	122		488	4	1	3	880
Percent				2.2		27.6	13.9		55.5	0.5	0.1	0.3	100.0
Std. Error				0.5		1.5	1.1		1.6	0.2	0.1	0.2	
Number				432		5517	2770		11080	91	23	68	19981
Statistical Week 36 (August 30 - Sept. 5)													
Sample Number				1		127	121	1	316	4	1	4	575
Percent				0.2		22.1	21.0	0.2	55.0	0.7	0.2	0.7	100.0
Std. Error				0.2		1.6	1.6	0.2	2.0	0.3	0.2	0.3	
Number				9		1111	1059	9	2764	35	9	35	5031
Statistical Week 37 (Sept. 6 - 12)													
Sample Number			1	3		40	64	1	235	3		4	351
Percent			0.3	0.9		11.4	18.2	0.3	67.0	0.9		1.1	100.0
Std. Error			0.3	0.5		1.6	1.9	0.3	2.3	0.5		0.5	
Number			7	22		292	467	7	1713	22		30	2560
Statistical Weeks 38 - 42 (Sept. 13 - October 17)													
Sample Number				1		17	73		243	2	1	3	340
Percent				0.3		5.0	21.5		71.5	0.6	0.3	0.9	100.0
Std. Error				0.3		1.1	2.0		2.2	0.4	0.3	0.5	
Number				5		85	365		1215	10	5	15	1700
Combined Periods (Percentages are weighted by period catches)													
Sample Number	2	1	255	474	3	6725	727	10	3186	16	7	20	11426
Percent	<0.1	<0.1	1.5	5.0	<0.1	61.4	5.1	0.1	26.6	0.1	0.1	0.1	100.0
Std. Error	<0.1	<0.1	0.1	0.2	<0.1	0.5	0.2	<0.1	0.4	<0.1	<0.1	<0.1	
Number	56	27	6039	20600	54	255518	21369	440	110710	288	253	461	415815

Appendix B.2 Estimated contribution of sockeye salmon stocks to the Lynn Canal (District 115) drift gill net fishery by age class and fishing period, 1987.

		Brood Year and Age Class													
		1984		1983		1982			1981			1980			
Stat Week	Stock	0.2	1.1	0.3	1.2	0.4	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total	Prop.
26	Chilkoot L.				79		4,601			158				4,838	0.649
	Chilkat L.				25		1,562	63		230				1,880	0.252
	Berners/Mainstem	8		230	31		457			8				734	0.098
	Total	8		230	135		6,620	63		396				7,452	1.000
27	Chilkoot L.		27		591		15,204	54		456				16,332	0.609
	Chilkat L.				84		2,666	161	27	592				3,530	0.132
	Berners/Mainstem			3,628	373		2,957							6,958	0.259
	Total		27	3,628	1,048		20,827	215	27	1,048				26,820	1.000
28	Chilkoot L.				343		4,163	25		129				4,660	0.651
	Chilkat L.				34		980	123		379				1,516	0.212
	Berners/Mainstem			466	48	16	453							983	0.137
	Total			466	425	16	5,596	148		508				7,159	1.000
29	Chilkoot L.				3,248		39,434	291	48	1,307				44,328	0.852
	Chilkat L.				193		4,725	436		1,456				6,810	0.131
	Berners/Mainstem	48		776						48				872	0.017
	Total	48		776	3,441		44,159	727	48	2,811				52,010	1.000
30	Chilkoot L.				4,749		38,788	214	53	2,252				46,056	0.897
	Chilkat L.				113		3,281	373		1,218	53			5,038	0.098
	Berners/Mainstem			214	49									263	0.005
	Total			214	4,911		42,069	587	53	3,470	53			51,357	1.000
31	Chilkoot L.				3,230		32,605	483	48	5,676				42,042	0.868
	Chilkat L.				151		2,874	1,011		2,036				6,072	0.125
	Berners/Mainstem			289	41									330	0.007
	Total			289	3,422		35,479	1,494	48	7,712				48,444	1.000
32	Chilkoot L.				5,046		54,170	562	210	25,871		70	70	85,999	0.846
	Chilkat L.				140		5,686	4,344		5,038		70		15,278	0.150
	Berners/Mainstem			280				70						350	0.003
	Total			280	5,186		59,856	4,976	210	30,909		140	70	101,627	1.000
33	Chilkoot L.				836		19,472	221		20,799			111	41,439	0.812
	Chilkat L.						1,376	4,294		3,728			56	9,454	0.185
	Berners/Mainstem			111										111	0.002
	Total			111	836		20,848	4,515		24,527			167	51,004	1.000
34	Chilkoot L.				728		12,706	458	38	18,339		76	38	32,383	0.796
	Chilkat L.						353	3,525		4,173	77		38	8,166	0.201
	Berners/Mainstem			38		38				45				121	0.003
	Total			38	728	38	13,059	3,983	38	22,557	77	76	76	40,670	1.000
35	Chilkoot L.				387		5,379	114		7,623				13,503	0.676
	Chilkat L.				23		138	2,656		3,457	91	23	68	6,456	0.323
	Berners/Mainstem				22									22	0.001
	Total				432		5,517	2,770		11,080	91	23	68	19,981	1.000
36	Chilkoot L.				9		1,058	26	9	1,426		9		2,537	0.504
	Chilkat L.						53	1,033		1,338	35		35	2,494	0.496
	Berners/Mainstem													0	0.000
	Total				9		1,111	1,059	9	2,764	35	9	35	5,031	1.000
37	Chilkoot L.				15		247	7	7	452				728	0.285
	Chilkat L.				7		45	460		1,261	22		30	1,825	0.713
	Berners/Mainstem			7										7	0.003
	Total			7	22		292	467	7	1,713	22		30	2,560	1.000
38-41	Chilkoot L.				5		50			90		5		150	0.088
	Chilkat L.						35	365		1,125	10		15	1,550	0.912
	Berners/Mainstem													0	0.000
	Total				5		85	365		1,215	10	5	15	1,700	1.000
38-41	Chilkoot L.	0	27	0	19,266	0	227,877	2,455	413	84,578	0	160	219	334,995	0.806
	Chilkat L.	0	0	0	770	0	23,774	18,844	27	26,031	288	93	242	70,069	0.169
	Berners/Mainstem	56	0	6,039	564	54	3,867	70	0	101	0	0	0	10,751	0.026
	Total	56	27	6,039	20,600	54	25,518	21,369	440	110,710	288	253	461	415,815	1.000

Appendix B.3 Age composition of Chilkoot Lake sockeye salmon harvested in Lynn Canal by fishing period, 1987.[a]

	Brood Year and Age Class								
	1984	1983	1982		1981		1980		
	1.1	1.2	1.3	2.2	1.4	2.3	2.4	3.3	Total
Statistical Week	26	(June 21 - 27)							
Percent		1.6	95.1			3.3			100.0
SE		11.9	2.4			7.1			3.4
Catch		79	4,601			158			4,838
Statistical Week	27	(June 28 - July 4)							
Percent	0.2	3.6	93.1	0.3		2.8			100.0
SE	0.0	7.9	2.4	15.3		8.2			3.4
Catch	27	591	15,204	54		456			16,332
Statistical Week	28	(July 5 - 11)							
Percent		7.4	89.3	0.5		2.8			100.0
SE		5.4	2.5	8.7		5.7			3.4
Catch		343	4,163	25		129			4,660
Statistical Week	29	(July 12 - 18)							
Percent		7.3	89.0	0.7	0.1	2.9			100.0
SE		2.7	1.0	12.6	0.0	6.7			1.3
Catch		3,248	39,434	291	48	1,307			44,328
Statistical Week	30	(July 19 - 25)							
Percent		10.3	84.2	0.5	0.1	4.9			100.0
SE		1.9	1.0	14.5	0.0	6.1			1.1
Catch		4,749	38,788	214	53	2,252			46,056
Statistical Week	31	(July 26 - August 1)							
Percent		7.7	77.6	1.1	0.1	13.5			100.0
SE		2.7	1.0	8.4	0.0	3.7			2.1
Catch		3,230	32,605	483	48	5,676			42,042
Statistical Week	32	(August 2 - 8)							
Percent		5.9	63.0	0.7	0.2	30.1	0.1	0.1	100.0
SE		1.9	1.0	3.8	0.0	2.0	35.4	0.0	1.2
Catch		5,046	54,170	562	210	25,871	70	70	85,999
Statistical Week	33	(August 9 - 15)							
Percent		2.0	47.0	0.5		50.2		0.3	100.0
SE		0.0	1.3	2.4		2.0		0.0	1.7
Catch		836	19,472	221		20,799		111	41,439

-Continued-

	1984	1983	1982		1981		1980		
	1.1	1.2	1.3	2.2	1.4	2.3	2.4	3.3	Total
Statistical Week	34	(August 16 - 22)							
Percent		2.2	39.2	1.4	0.1	56.6	0.2	0.1	100.0
SE		0.0	0.9	3.2	0.0	1.9	0.0	0.0	1.7
Catch		728	12,706	458	38	18,339	76	38	32,383
Statistical Week	35	(August 23 - 29)							
Percent		2.9	39.8	0.8		56.5			100.0
SE		7.0	1.0	1.8		2.3			2.5
Catch		387	5,379	114		7,623			13,503
Statistical Week	36	(August 30 - Sept. 5)							
Percent		0.4	41.7	1.0	0.4	56.2	0.4		100.0
SE		0.0	1.9	1.4	0.0	3.0	0.0		4.2
Catch		9	1,058	26	9	1,426	9		2,537
Statistical Week	37	(Sept. 6 - 12)							
Percent		2.0	33.9	1.0	1.0	62.1			100.0
SE		27.2	5.8	1.6	0.0	3.1			8.9
Catch		15	247	7	7	452			728
Statistical Week	38 - 42	(Sept. 13 - October 17)							
Percent		3.3	33.3			60.0	3.3		100.0
SE		0.0	11.9			2.0	0.0		20.2
Catch		5	50			90	5		150
Combined Periods (Perecntages are weighted by period catches)									
Percent	<0.1	5.8	68.0	0.7	0.1	25.2	<0.1	0.1	100.0
SE									0.6
Catch	27	19,266	227,877	2,455	413	84,578	160	219	334,995

* Standard error for individual age classes from Pella and Robertson calculation expressed as a percent. Standard error for strata total is from the delta method described in Seber (1982).

Appendix B.4 Age composition of Chilkat Lake sockeye salmon harvested in Lynn Canal by fishing period, 1987.

	Brood Year and Age Class								
	1983	1982		1981			1980		
	1.2	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total
Statistical Week	26	(June 21 - 27)							
Percent	1.3	83.1	3.4		12.3				100.0
SE	9.6	1.5	0.0		7.2				5.6
Catch	25	1,562	63		230				1,880
Statistical Week	27	(June 28 - July 4)							
Percent	2.4	75.5	4.6	0.8	16.8				100.0
SE	4.4	1.3	15.3	0.0	8.2				8.6
Catch	84	2,666	161	27	592				3,530
Statistical Week	28	(July 5 - 11)							
Percent	2.2	64.6	8.1		25.0				100.0
SE	3.9	1.5	8.7		5.7				7.7
Catch	34	980	123		379				1,516
Statistical Week	29	(July 12 - 18)							
Percent	2.8	69.4	6.4		21.4				100.0
SE	2.7	1.0	12.6		6.7				7.6
Catch	193	4,725	436		1,456				6,810
Statistical Week	30	(July 19 - 25)							
Percent	2.2	65.1	7.4		24.2	1.1			100.0
SE	1.6	1.0	14.5		6.1	0.0			10.0
Catch	113	3,281	373		1,218	53			5,038
	449	13,214	1,156	27	3,675	53			18,774
Statistical Week	31	(July 26 - August 1)							
Percent	2.5	47.3	16.7		33.5				100.0
SE	2.5	1.0	8.4		3.7				14.3
Catch	151	2,874	1,011		2,036				6,072
Statistical Week	32	(August 2 - 8)							
Percent	0.9	37.2	28.4		33.0		0.5		100.0
SE	1.9	1.0	4.0		2.0		35.4		6.4
Catch	140	5,686	4,344		5,038		70		15,278

-Continued-

	1983	1982		1981			1980		
	1.2	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total
Statistical Week		33	(August 9 - 15)						
Percent		14.6	45.4		39.4			0.6	100.0
SE		1.3	2.4		2.0			27.2	7.4
Catch		1,376	4,294		3,728			56	9,454
Statistical Week		34	(August 16 - 22)						
Percent		4.3	43.2		51.1	0.9		0.5	100.0
SE		0.9	3.2		1.9	0.0		35.4	6.6
Catch		353	3,525		4,173	77		38	8,166
Statistical Week		35	(August 23 - 29)						
Percent	0.4	2.1	41.1		53.5	1.4	0.4	1.1	100.0
SE	5.3	1.0	1.8		2.3	0.0	0.0	0.0	5.7
Catch	23	138	2,656		3,457	91	23	68	6,456
Statistical Week		36	(August 30 - Sept. 5)						
Percent		2.1	41.4		53.6	1.4		1.4	100.0
SE		1.9	1.4		3.0	0.0		0.0	4.4
Catch		53	1,033		1,338	35		35	2,494
Statistical Week		37	(Sept. 6 - 12)						
Percent	0.4	2.5	25.2		69.1	1.2		1.6	100.0
SE	27.2	5.8	1.6		3.1	0.0		0.0	3.7
Catch	7	45	460		1,261	22		30	1,825
Statistical Week		38 - 42	(Sept. 13 - October 17)						
Percent		2.3	23.5		72.6	0.6		1.0	100.0
SE		11.9	0.0		2.0	0.0		0.0	1.9
Catch		35	365		1,125	10		15	1,550
Combined Periods (Perecntages are weighted by period catches)									
Percent	1.1	33.9	26.9	<0.1	37.2	0.4	0.1	0.3	100.0
SE									2.5
Catch	770	23,774	18,844	27	26,031	288	93	242	70,069

[a] Standard error for individual age classes from Pella and Robertson calculation expressed as a percent. Standard error for strata total is from the delta method described in Seber (1982).

Appendix B.5 Age composition of Berners Bay/Chilkat Mainstem sockeye salmon harvested in Lynn Canal by fishing period, 1987.[a]

	Brood Year and Age Class							
	1984	1983		1982			1981	
	0.2	0.3	1.2	0.4	1.3	2.2	2.3	Total
Statistical Week	26	(June 21 - 27)						
Percent	1.1	31.4	4.2		62.3		1.1	100.0
SE	0.0	0.0	10.4		2.0		2.0	18.8
Catch	8	230	31		457		8	734
Statistical Week	27	(June 28 - July 4)						
Percent		52.1	5.4		42.5			100.0
SE		0.0	7.7		2.3			7.9
Catch		3,628	373		2,957			6,958
Statistical Week	28	(July 5 - 11)						
Percent		47.4	4.8	1.6	46.1			100.0
SE		0.0	4.5	0.0	2.2			14.0
Catch		466	48	16	453			983
Statistical Week	29	(July 12 - 18)						
Percent	5.5	89.0					5.5	100.0
SE	0.0	0.0					1.7	23.1
Catch	48	776					48	872
Statistical Week	30	(July 19 - 25)						
Percent		81.3	18.7					100.0
SE		0.0	1.1					46.2
Catch		214	49					263
Statistical Week	31	(July 26 - August 1)						
Percent		87.6	12.4					100.0
SE		0.0	1.4					46.1
Catch		289	41					330
Statistical Week	32	(August 2 - 8)						
Percent		80.1				19.9		100.0
SE		0.0				1.4		45.6
Catch		280				70		350
Statistical Week	33	(August 9 - 15)						
Percent		100.0						100.0
SE		0.0						73.9
Catch		111						111
Statistical Week	34	(August 16 - 22)						
Percent		31.4		31.4			37.2	100.0
SE		0.0		0.0			0.2	56.7
Catch		38		38			45	121
Statistical Week	35	(August 23 - 29)						
Percent			100.0					100.0
SE			0.0					22.5
Catch			22					22
Statistical Week	37	(Sept. 6 - 12)						
Percent		100.0						100.0
SE		0.0						97.4
Catch		7						7
Combined Periods (Perecntages are weighted by period catches)								
Percent	0.5	56.2	5.2	0.5	36.0	0.6	0.9	100.0
SE								6.3
Catch	56	6,039	564	54	3,867	70	101	10,751

[a] Standard error for individual age classes from Pella and Robertson calculation expressed as a percent. Standard error for strata total is from the delta method described in Seber (1982).

Appendix B.6. Length composition of Chilkoot Lake sockeye salmon harvested in Lynn Canal (District 115) by sex, age class, and fishing period, 1987.

		Brood Year and Age Class				
		1983	1982		1981	
		1.2	1.3	2.2	1.4	2.3
Statistical Week 26 (June 21 - 27)						
Male	Avg. Length		598			599
	Std. Error		2.3			9.4
	Sample Size		58			4
Female	Avg. Length	518	589			597
	Std. Error	17.5	2.2			9.7
	Sample Size	2	57			5
All Fish	Avg. Length	518	594			598
	Std. Error	17.5	1.6			6.4
	Sample Size	2	115			9
Statistical Week 27 (June 28 - July 4)						
Male	Avg. Length	492	596	470		603
	Std. Error	12.2	2.4	20.0		15.4
	Sample Size	6	108	2		5
Female	Avg. Length		587			588
	Std. Error		1.6			11.7
	Sample Size		142			5
All Fish	Avg. Length	492	591	470		596
	Std. Error	12.2	1.4	20.0		9.4
	Sample Size	6	253	2		10
Statistical Week 28 (July 5 - 11)						
Male	Avg. Length	498	591			571
	Std. Error	8.5	3.2			17.1
	Sample Size	4	74			4
Female	Avg. Length	481	582	520		600
	Std. Error	8.1	2.6			20.0
	Sample Size	6	72	1		2
All Fish	Avg. Length	488	587	520		581
	Std. Error	6.2	2.1			13.4
	Sample Size	10	146	1		6
Statistical Week 29 (July 12 - 18)						
Male	Avg. Length	513	598			588
	Std. Error	14.1	2.1			7.5
	Sample Size	9	73			2
Female	Avg. Length	541	583			588
	Std. Error	20.3	3.0			10.9
	Sample Size	5	76			4
All Fish	Avg. Length	523	590			588
	Std. Error	11.7	1.9			7.2
	Sample Size	14	149			6
Statistical Week 30 (July 19 - 25)						
Male	Avg. Length	504	593	500		598
	Std. Error	9.1	3.7			10.1
	Sample Size	17	49	1		3
Female	Avg. Length	564	585	525		607
	Std. Error	21.3	2.6			6.0
	Sample Size	5	49	1		3
All Fish	Avg. Length	517	589	513		603
	Std. Error	9.9	2.3	12.5		5.6
	Sample Size	22	98	2		6
Statistical Week 31 (July 26 - August 1)						
Male	Avg. Length	498	591			586
	Std. Error	12.1	2.5			6.8
	Sample Size	15	93			15
Female	Avg. Length	504	579	528		584
	Std. Error	16.0	2.3	22.5		3.4
	Sample Size	7	95	2		23
All Fish	Avg. Length	500	585	528		585
	Std. Error	9.5	1.7	22.5		3.3
	Sample Size	22	188	2		38

		Brood Year and Age Class				
		1983	1982		1981	
		1.2	1.3	2.2	1.4	2.3
Statistical Week 32 (August 2 - 8)						
Male	Avg. Length	513	598	475		601
	Std. Error	22.8	2.4			3.3
	Sample Size	9	71	1		46
Female	Avg. Length	496	586		590	584
	Std. Error	10.8	1.9			2.8
	Sample Size	10	117		1	59
All Fish	Avg. Length	504	590	475	590	591
	Std. Error	12.0	1.5			2.3
	Sample Size	19	188	1	1	105
Statistical Week 33 (August 9 - 15)						
Male	Avg. Length	518	597			606
	Std. Error	10.2	14.1			3.8
	Sample Size	6	44			45
Female	Avg. Length	515	591			587
	Std. Error	15.0	2.5			2.9
	Sample Size	2	58			58
All Fish	Avg. Length	518	594			596
	Std. Error	8.0	6.2			2.5
	Sample Size	8	102			103
Statistical Week 34 (August 16 - 22)						
Male	Avg. Length	490	599	540		602
	Std. Error	25.0	6.9	5.0		3.7
	Sample Size	3	21	3		44
Female	Avg. Length	533	586			585
	Std. Error	42.5	4.0			3.0
	Sample Size	2	38			52
All Fish	Avg. Length	507	591	540		593
	Std. Error	21.8	3.6	5.0		2.5
	Sample Size	5	59	3		96
Statistical Week 35 (August 23 - 29)						
Male	Avg. Length	490	591	540		593
	Std. Error		4.0	5.0		3.4
	Sample Size	1	25	2		37
Female	Avg. Length	515	578			585
	Std. Error	15.0	4.0			2.9
	Sample Size	2	23			40
All Fish	Avg. Length	507	585	540		589
	Std. Error	12.0	3.0	5.0		2.3
	Sample Size	3	48	2		77
Statistical Week 36 (August 30 - Sept. 5)						
Male	Avg. Length		605	505		600
	Std. Error		4.2			3.9
	Sample Size		17	1		28
Female	Avg. Length		576	540		573
	Std. Error		5.0			5.0
	Sample Size		14	1		22
All Fish	Avg. Length		592	523		588
	Std. Error		4.1	17.5		3.6
	Sample Size		31	2		50
Statistical Week 37 (Sept. 6 - 12)						
Male	Avg. Length		606			601
	Std. Error		7.0			5.1
	Sample Size		7			20
Female	Avg. Length		605			594
	Std. Error		45.0			3.6
	Sample Size		2			7
All Fish	Avg. Length		606			599
	Std. Error		9.2			3.9
	Sample Size		9			27
Combined Periods (Unweighted)						
Male	Avg. Length	504	595	512		599
	Std. Error	5.0	1.3	10.5		1.6
	Sample Size	70	640	10		253
Female	Avg. Length	514	585	528	590	585
	Std. Error	6.7	0.8	7.8		1.3
	Sample Size	41	743	5	1	280
All Fish	Avg. Length	508	590	517	590	592
	Std. Error	4.0	0.7	7.6		1.0
	Sample Size	111	1386	15	1	533

Appendix B.7. Length composition of Chilkat Lake sockeye salmon harvested in Lynn Canal (District 115) by sex, age class, and fishing period, 1987.

		Brood Year and Age Class						
		1983	1982			1981		1980
		1.2	1.3	2.2	1.4	2.3	3.2	3.3
Statistical Week 26 (June 21 - 27)								
Male	Avg. Length		583	528		613		
	Std. Error		9.9	7.5		11.7		
	Sample Size		16	2		3		
Female	Avg. Length		605			603		
	Std. Error		4.5			9.7		
	Sample Size		22			6		
All Fish	Avg. Length		596	528		606		
	Std. Error		5.2	7.5		7.3		
	Sample Size		38	2		9		
Statistical Week 27 (June 28 - July 4)								
Male	Avg. Length		592	520		570		
	Std. Error		9.4	15.0		21.9		
	Sample Size		19	2		4		
Female	Avg. Length	525	589	510	625	582		
	Std. Error		4.4			11.0		
	Sample Size	1	24	1	1	5		
All Fish	Avg. Length	525	589	517	625	577		
	Std. Error		4.9	9.3		10.9		
	Sample Size	1	44	3	1	9		
Statistical Week 28 (July 5 - 11)								
Male	Avg. Length		621			600		
	Std. Error		4.7			15.3		
	Sample Size		9			3		
Female	Avg. Length		598	570		578		
	Std. Error		4.4	8.4		42.5		
	Sample Size		19	4		2		
All Fish	Avg. Length		605	570		591		
	Std. Error		3.9	8.4		16.8		
	Sample Size		28	4		5		
Statistical Week 29 (July 12 - 18)								
Male	Avg. Length		613	568		618		
	Std. Error		16.0	7.5		7.5		
	Sample Size		8	2		2		
Female	Avg. Length		597			615		
	Std. Error		4.2					
	Sample Size		6			1		
All Fish	Avg. Length		606	568		617		
	Std. Error		9.3	7.5		4.4		
	Sample Size		14	2		3		
Statistical Week 30 (July 19 - 25)								
Male	Avg. Length		618					
	Std. Error		22.5					
	Sample Size		2					
Female	Avg. Length		603			585	590	
	Std. Error		14.5			8.9		
	Sample Size		4			4	1	
All Fish	Avg. Length		608			585	590	
	Std. Error		11.3			8.9		
	Sample Size		6			4	1	

-Continued-

		Brood Year and Age Class						
		1983	1982		1981			1980
		1.2	1.3	2.2	1.4	2.3	3.2	3.3
Statistical Week 31 (July 26 - August 1)								
Male	Avg. Length	550	607	545		598		
	Std. Error		8.6	45.0		1.7		
	Sample Size	1	5	2		3		
Female	Avg. Length		604	556		580		
	Std. Error		4.1	18.3		7.1		
	Sample Size		9	4		11		
All Fish	Avg. Length	550	605	553		584		
	Std. Error		3.9	16.6		5.9		
	Sample Size	1	14	6		14		
Statistical Week 32 (August 2 - 8)								
Male	Avg. Length		613	546		619		
	Std. Error		11.5	13.7		11.2		
	Sample Size		6	5		5		
Female	Avg. Length		596	555		593		
	Std. Error		6.1			8.2		
	Sample Size		12	2		9		
All Fish	Avg. Length		602	549		603		
	Std. Error		5.7	9.6		7.2		
	Sample Size		18	7		14		
Statistical Week 33 (August 9 - 15)								
Male	Avg. Length		630	577		610		610
	Std. Error			11.1		19.5		
	Sample Size		1	9		5		1
Female	Avg. Length		585	563		599		
	Std. Error		30.0	5.2		8.8		
	Sample Size		2	4		9		
All Fish	Avg. Length		600	572		603		610
	Std. Error		22.9	7.9		8.6		
	Sample Size		3	13		14		1
Statistical Week 34 (August 16 - 22)								
Male	Avg. Length			564		642		
	Std. Error			8.4		9.9		
	Sample Size			8		3		
Female	Avg. Length		593	555		592		
	Std. Error		2.5	10.2		6.1		
	Sample Size		2	7		9		
All Fish	Avg. Length		593	560		605		
	Std. Error		2.5	6.4		8.2		
	Sample Size		2	15		12		
Statistical Week 35 (August 23 - 29)								
Male	Avg. Length		550	568		591		
	Std. Error			5.6		6.3		
	Sample Size		1	28		28		
Female	Avg. Length		620	551		587	560	
	Std. Error			5.7		4.7		
	Sample Size		1	26		31	1	
All Fish	Avg. Length		585	560		589	560	
	Std. Error		35.0	4.1		3.8		
	Sample Size		2	54		59	1	

-Continued-

Appendix B.7. (page 3 of 3)

		Brood Year and Age Class						
		1983	1982			1981		1980
		1.2	1.3	2.2	1.4	2.3	3.2	3.3
Statistical Week 36 (August 30 - Sept. 5)								
Male	Avg. Length		625	573		625		
	Std. Error		5.8	5.0		4.4		
	Sample Size		3	20		24		
Female	Avg. Length		580	553		601	550	
	Std. Error			7.6		6.0		
	Sample Size		1	13		19	1	
All Fish	Avg. Length		614	565		615	550	
	Std. Error		12.0	4.5		4.1		
	Sample Size		4	33		43	1	
Statistical Week 37 (Sept. 6 - 12)								
Male	Avg. Length		638	571		631		638
	Std. Error		7.5	7.7		3.1		17.5
	Sample Size		2	14		42		2
Female	Avg. Length	515		548		615		
	Std. Error			18.8		3.0		
	Sample Size	1		3		26		
All Fish	Avg. Length	515	638	567		625		638
	Std. Error		7.5	7.2		2.4		17.5
	Sample Size	1	2	17		68		2
Statistical Weeks 38 - 41 (Sept. 13 - 19) October 4 - 10								
Male	Avg. Length							
	Std. Error							
	Sample Size							
Female	Avg. Length							
	Std. Error							
	Sample Size							
All Fish	Avg. Length							
	Std. Error							
	Sample Size							
Combined Periods (Unweighted)								
Male	Avg. Length	550	602	566		615		628
	Std. Error		4.4	3.1		2.8		13.6
	Sample Size	1	72	92		122		3
Female	Avg. Length	520	597	554	625	596	567	
	Std. Error	5.0	2.0	3.3		2.2	12.0	
	Sample Size	2	102	64	1	132	3	
All Fish	Avg. Length	530	599	561	625	605	567	628
	Std. Error	10.4	2.2	2.3		1.9	12.0	13.6
	Sample Size	3	175	156	1	254	3	3

Appendix B.8. Length composition of Berners Bay/Chilkat Mainstem sockeye salmon harvested in Lynn Canal (District 115) by sex, age class, and fishing period, 1987.

		Brood Year and Age Class				
		1984	1983		1982	
		0.2	0.3	1.2	0.4	1.3
Statistical Week 26 (June 21 - 27)						
Male	Avg. Length		584			605
	Std. Error		12.6			8.3
	Sample Size		4			16
Female	Avg. Length		598			611
	Std. Error		2.5			8.1
	Sample Size		2			5
All Fish	Avg. Length		588			606
	Std. Error		8.5			6.5
	Sample Size		6			21
Statistical Week 27 (June 28 - July 4)						
Male	Avg. Length		603	529		605
	Std. Error		4.7	6.9		5.9
	Sample Size		32	4		26
Female	Avg. Length		588	510		596
	Std. Error		2.9			3.6
	Sample Size		35	1		35
All Fish	Avg. Length		595	524		600
	Std. Error		2.8	5.4		3.3
	Sample Size		67	6		61
Statistical Week 28 (July 5 - 11)						
Male	Avg. Length		601	520		620
	Std. Error		8.3	7.6		
	Sample Size		6	3		1
Female	Avg. Length		584			587
	Std. Error		7.1			7.1
	Sample Size		7			15
All Fish	Avg. Length		592	520		589
	Std. Error		5.7	7.6		7.0
	Sample Size		13	3		16
Statistical Week 29 (July 12 - 18)						
Male	Avg. Length	545	593			
	Std. Error		4.8			
	Sample Size	1	4			
Female	Avg. Length		600			
	Std. Error					
	Sample Size		1			
All Fish	Avg. Length	545	594			
	Std. Error		4.0			
	Sample Size	1	5			
Statistical Week 31 (July 26 - August 1)						
Male	Avg. Length		605			
	Std. Error		5.0			
	Sample Size		2			
Female	Avg. Length			500		
	Std. Error					
	Sample Size			1		
All Fish	Avg. Length		605	500		
	Std. Error		5.0			
	Sample Size		2	1		

-Continued-

Appendix B.8. (page 2 of 2).

		Brood Year and Age Class				
		1984	1983		1982	
		0.2	0.3	1.2	0.4	1.3
Statistical Week 32 (August 2 - 8)						
Male	Avg. Length		625			
	Std. Error					
	Sample Size		1			
Female	Avg. Length		585			
	Std. Error					
	Sample Size		1			
All Fish	Avg. Length		605			
	Std. Error		20.0			
	Sample Size		2			
Statistical Week 34 (August 16 - 22)						
Male	Avg. Length				600	
	Std. Error					
	Sample Size				1	
Female	Avg. Length					
	Std. Error					
	Sample Size					
All Fish	Avg. Length				600	
	Std. Error					
	Sample Size				1	
Statistical Week 37 (Sept. 6 - 12)						
Male	Avg. Length		630			
	Std. Error					
	Sample Size		1			
Female	Avg. Length					
	Std. Error					
	Sample Size					
All Fish	Avg. Length		630			
	Std. Error					
	Sample Size		1			
Combined Periods (Unweighted)						
Male	Avg. Length	545	601	525	600	605
	Std. Error		3.5	5.0	-	3.1
	Sample Size	1	50	7	1	43
Female	Avg. Length		588	505		595
	Std. Error		2.5	5.0		2.8
	Sample Size		46	2		55
All Fish	Avg. Length	545	595	521	600	600
	Std. Error		2.2	4.4		3.0
	Sample Size	1	96	10	1	98

Appendix B.9. Stock composition estimates of sockeye salmon from scales collected from various sites in Lynn Canal, by week, 1987.

Part A. Scales collected at Pt. Sherman in the commercial drift gill net fishery.

Stat Week	Dates	Sample Size	Chilkoot Lake	Chilkat Lake	Berners/ Mainstem	Total
26	6/23-24	185	62.7	24.9	12.4	100.0
27	7/01	137	54.0	33.6	12.4	100.0
29	7/15	132	87.9	9.1	3.0	100.0
30	7/20	129	79.8	15.5	4.7	100.0
31	7/28	97	76.3	19.6	4.1	100.0
32	8/1-4	166	76.5	21.7	1.8	100.0
33	8/10	310	82.9	15.2	1.9	100.0
34	8/18	112	71.4	27.7	0.9	100.0
35[a]	8/24	130	11.6	81.5	6.9	100.0

[a] Samples from Mab Island.

Part B. Scales collected at Pt. Sherman in the test drift gill net fishery.

Stat Week	Dates	Sample Size	Chilkoot Lake	Chilkat Lake	Berners/ Mainstem	Total
29	7/17	62	75.8	14.5	9.7	100.0
30	7/24	65	83.1	12.3	4.6	100.0
31	7/30	38	84.2	10.5	5.3	100.0
32	8/8	36	86.1	13.9	0.0	100.0
33	8/13	75	58.7	41.3	0.0	100.0

Part C. Scales collected at various sites in the commercial drift gill net fishery.

Stat Week	Location	Dates	Sample Size	Chilkoot Lake	Chilkat Lake	Berners/ Mainstem	Total
27	Mud Bay	7/01	133	94.0	1.5	4.5	100.0
29	Mud Bay	7/15	138	87.7	9.4	2.9	100.0
30	Pt. Seduction	7/24	22	22.7	68.2	9.1	100.0
31	Horton	7/28	51	39.2	58.8	2.0	100.0
	Mud Bay	7/29	165	92.1	6.7	1.2	100.0
32	Mud Bay	8/3	132	99.2	0.8	0.0	100.0
33	Slide	8/10	64	92.2	7.8	0.0	100.0
	Mud Bay	8/10	195	94.4	5.1	0.5	100.0
	Mud Bay West Side	8/10	216	94.9	4.6	0.5	100.0
34	Sullivan	8/18	136	50.0	47.8	2.2	100.0
	Horton	8/18	31	54.8	45.2	0	100.0
	Mud Bay	8/18	105	94.3	4.8	0.9	100.0
35	Horton	8/24	319	6.3	92.5	1.2	100.0

Part D. Scales collected in Chilkat Inlet in the test drift gill net fishery.

Stat Week	Dates	Sample Size	Chilkoot Lake	Chilkat Lake	Berners/ Mainstem	Total
31	7/30	18	0.0	88.9	11.1	100.0
32	8/8	20	5.0	95.0	0.0	100.0
33	8/14	100	8.0	88.0	4.0	100.0
34	8/21	15	13.3	66.7	20.0	100.0

Appendix C.1. Daily sockeye salmon counts and associated statistics from Chilkat Lake weir, 1987.

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cumulative Proportion of Total
June	18	0	0	0.0000	0.0000
June	19	0	0	0.0000	0.0000
June	20	0	0	0.0000	0.0000
June	21	0	0	0.0000	0.0000
June	22	0	0	0.0000	0.0000
June	23	0	0	0.0000	0.0000
June	24	38	38	0.0008	0.0008
June	25	0	38	0.0000	0.0008
June	26	33	71	0.0007	0.0015
June	27	17	88	0.0003	0.0018
June	28	153	241	0.0031	0.0050
June	29	501	742	0.0103	0.0153
June	30	262	1004	0.0054	0.0207
July	1	261	1265	0.0054	0.0260
July	2	18	1283	0.0004	0.0264
July	3	568	1851	0.0117	0.0381
July	4	14	1865	0.0003	0.0384
July	5	67	1932	0.0014	0.0398
July	6	24	1956	0.0005	0.0403
July	7	662	2618	0.0136	0.0539
July	8	56	2674	0.0012	0.0550
July	9	1026	3700	0.0211	0.0761
July	10	240	3940	0.0049	0.0811
July	11	122	4062	0.0025	0.0836
July	12	193	4255	0.0040	0.0876
July	13	101	4356	0.0021	0.0896
July	14	177	4533	0.0036	0.0933
July	15	851	5384	0.0175	0.1108
July	16	48	5432	0.0010	0.1118
July	17	2223	7655	0.0457	0.1575
July	18	2008	9663	0.0413	0.1989
July	19	1279	10942	0.0263	0.2252
July	20	560	11502	0.0115	0.2367
July	21	703	12205	0.0145	0.2512
July	22	0	12205	0.0000	0.2512
July	23	0	12205	0.0000	0.2512
July	24	0	12205	0.0000	0.2512
July	25	0	12205	0.0000	0.2512
July	26	0	12205	0.0000	0.2512
July	27	0	12205	0.0000	0.2512
July	28	1	12206	0.0000	0.2512
July	29	0	12206	0.0000	0.2512
July	30	0	12206	0.0000	0.2512
July	31	0	12206	0.0000	0.2512
Aug.	1	0	12206	0.0000	0.2512
Aug.	2	0	12206	0.0000	0.2512
Aug.	3	0	12206	0.0000	0.2512
Aug.	4	0	12206	0.0000	0.2512
Aug.	5	8	12214	0.0002	0.2514
Aug.	6	13	12227	0.0003	0.2516
Aug.	7	2	12229	0.0000	0.2517
Aug.	8	100	12329	0.0021	0.2537
Aug.	9	568	12897	0.0117	0.2654

-Continued-

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cumulative Proportion of Total
Aug.	10	839	13736	0.0173	0.2827
Aug.	11	7	13743	0.0001	0.2828
Aug.	12	247	13990	0.0051	0.2879
Aug.	13	113	14103	0.0023	0.2902
Aug.	14	2	14105	0.0000	0.2903
Aug.	15	0	14105	0.0000	0.2903
Aug.	16	20	14125	0.0004	0.2907
Aug.	17	58	14183	0.0012	0.2919
Aug.	18	78	14261	0.0016	0.2935
Aug.	19	277	14538	0.0057	0.2992
Aug.	20	947	15485	0.0195	0.3187
Aug.	21	440	15925	0.0091	0.3277
Aug.	22	55	15980	0.0011	0.3289
Aug.	23	423	16403	0.0087	0.3376
Aug.	24	2130	18533	0.0438	0.3814
Aug.	25	121	18654	0.0025	0.3839
Aug.	26	1021	19675	0.0210	0.4049
Aug.	27	337	20012	0.0069	0.4118
Aug.	28	753	20765	0.0155	0.4273
Aug.	29	1408	22173	0.0290	0.4563
Aug.	30	135	22308	0.0028	0.4591
Aug.	31	435	22743	0.0090	0.4680
Sept.	1	23	22766	0.0005	0.4685
Sept.	2	610	23376	0.0126	0.4811
Sept.	3	413	23789	0.0085	0.4896
Sept.	4	2	23791	0.0000	0.4896
Sept.	5	0	23791	0.0000	0.4896
Sept.	6	26	23817	0.0005	0.4901
Sept.	7	0	23817	0.0000	0.4901
Sept.	8	0	23817	0.0000	0.4901
Sept.	9	0	23817	0.0000	0.4901
Sept.	10	0	23817	0.0000	0.4901
Sept.	11	0	23817	0.0000	0.4901
Sept.	12	1	23818	0.0000	0.4902
Sept.	13	0	23818	0.0000	0.4902
Sept.	14	0	23818	0.0000	0.4902
Sept.	15	0	23818	0.0000	0.4902
Sept.	16	0	23818	0.0000	0.4902
Sept.	17	0	23818	0.0000	0.4902
Sept.	18	156	23974	0.0032	0.4934
Sept.	19	103	24077	0.0021	0.4955
Sept.	20	755	24832	0.0155	0.5110
Sept.	21	1213	26045	0.0250	0.5360
Sept.	22	2862	28907	0.0589	0.5949
Sept.	23	6621	35528	0.1363	0.7311
Sept.	24	4052	39580	0.0834	0.8145
Sept.	25	2352	41932	0.0484	0.8629
Sept.	26	178	42110	0.0037	0.8666
Sept.	27	378	42488	0.0078	0.8744
Sept.	28	1502	43990	0.0309	0.9053
Sept.	29	106	44096	0.0022	0.9075
Sept.	30	4179	48275	0.0860	0.9935

-Continued-

Oct.	1	0	48275	0.0000	0.9935
Oct.	2	0	48275	0.0000	0.9935
Oct.	3	0	48275	0.0000	0.9935
Oct.	4	0	48275	0.0000	0.9935
Oct.	5	0	48275	0.0000	0.9935
Oct.	6	0	48275	0.0000	0.9935
Oct.	7	0	48275	0.0000	0.9935
Oct.	8	0	48275	0.0000	0.9935
Oct.	9	0	48275	0.0000	0.9935
Oct.	10	0	48275	0.0000	0.9935
Oct.	11	0	48275	0.0000	0.9935
Oct.	12	0	48275	0.0000	0.9935
Oct.	13	0	48275	0.0000	0.9935
Oct.	14	0	48275	0.0000	0.9935
Oct.	15	0	48275	0.0000	0.9935
Oct.	16	2	48277	0.0000	0.9935
Oct.	17	17	48294	0.0003	0.9938
Oct.	18	1	48295	0.0000	0.9939
Oct.	19	61	48356	0.0013	0.9951
Oct.	20	60	48416	0.0012	0.9964
Oct.	21	7	48423	0.0001	0.9965
Oct.	22	11	48434	0.0002	0.9967
Oct.	23	4	48438	0.0001	0.9968
Oct.	24	11	48449	0.0002	0.9970
Oct.	25	7	48456	0.0001	0.9972
Oct.	26	25	48481	0.0005	0.9977
Oct.	27	3	48484	0.0001	0.9978
Oct.	28	3	48487	0.0001	0.9978
Oct.	29	5	48492	0.0001	0.9979
Oct.	30	6	48498	0.0001	0.9980
Oct.	31	7	48505	0.0001	0.9982
Nov.	1	5	48510	0.0001	0.9983
Nov.	2	6	48516	0.0001	0.9984
Nov.	3	5	48521	0.0001	0.9985
Nov.	4	0	48521	0.0000	0.9985
Nov.	5	1	48522	0.0000	0.9985
Nov.	6	8	48530	0.0002	0.9987
Nov.	7	7	48537	0.0001	0.9988
Nov.	8	1	48538	0.0000	0.9989
Nov.	9	5	48543	0.0001	0.9990
Nov.	10	9	48552	0.0002	0.9992
Nov.	11	4	48556	0.0001	0.9992
Nov.	12	22	48578	0.0005	0.9997
Nov.	13	4	48582	0.0001	0.9998
Nov.	14	2	48584	0.0000	0.9998
Nov.	15	3	48587	0.0001	0.9999
Nov.	16	0	48587	0.0000	0.9999
Nov.	17	2	48589	0.0000	0.9999
Nov.	18	2	48591	0.0000	1.0000
Nov.	19	0	48591	0.0000	1.0000
Nov.	20	2	48593	0.0000	1.0000

Mean Day of Migration = Aug. 30 Variance = 960.9 Days squared

Appendix C.2. Daily sockeye salmon counts and associated statistics from Chilkoot Lake weir, 1987.

Date		Daily Count	Cumulative Count	Daily Proportion of Total	Cumulative Proportion of Total
June	4	0	0	0.0000	0.0000
June	5	1	1	0.0000	0.0000
June	6	10	11	0.0001	0.0001
June	7	31	42	0.0003	0.0004
June	8	6	48	0.0001	0.0005
June	9	22	70	0.0002	0.0007
June	10	36	106	0.0004	0.0011
June	11	27	133	0.0003	0.0014
June	12	43	176	0.0005	0.0018
June	13	11	187	0.0001	0.0020
June	14	10	197	0.0001	0.0021
June	15	10	207	0.0001	0.0022
June	16	8	215	0.0001	0.0023
June	17	7	222	0.0001	0.0023
June	18	14	236	0.0001	0.0025
June	19	40	276	0.0004	0.0029
June	20	109	385	0.0011	0.0040
June	21	8083	8468	0.0849	0.0890
June	22	2927	11395	0.0308	0.1197
June	23	2717	14112	0.0285	0.1483
June	24	1120	15232	0.0118	0.1600
June	25	384	15616	0.0040	0.1641
June	26	654	16270	0.0069	0.1709
June	27	698	16968	0.0073	0.1783
June	28	926	17894	0.0097	0.1880
June	29	2350	20244	0.0247	0.2127
June	30	1048	21292	0.0110	0.2237
July	1	933	22225	0.0098	0.2335
July	2	224	22449	0.0024	0.2358
July	3	977	23426	0.0103	0.2461
July	4	421	23847	0.0044	0.2505
July	5	1012	24859	0.0106	0.2612
July	6	630	25489	0.0066	0.2678
July	7	425	25914	0.0045	0.2722
July	8	336	26250	0.0035	0.2758
July	9	263	26513	0.0028	0.2785
July	10	515	27028	0.0054	0.2840
July	11	184	27212	0.0019	0.2859
July	12	708	27920	0.0074	0.2933
July	13	1269	29189	0.0133	0.3067
July	14	1326	30515	0.0139	0.3206
July	15	1025	31540	0.0108	0.3314
July	16	918	32458	0.0096	0.3410
July	17	756	33214	0.0079	0.3489
July	18	998	34212	0.0105	0.3594
July	19	4325	38537	0.0454	0.4049
July	20	908	39445	0.0095	0.4144
July	21	638	40083	0.0067	0.4211
July	22	424	40507	0.0045	0.4256
July	23	209	40716	0.0022	0.4278
July	24	468	41184	0.0049	0.4327
July	25	1162	42346	0.0122	0.4449
July	26	987	43333	0.0104	0.4553
July	27	3917	47250	0.0412	0.4964
July	28	958	48208	0.0101	0.5065
July	29	830	49038	0.0087	0.5152
July	30	616	49654	0.0065	0.5217
July	31	748	50402	0.0079	0.5295
Aug.	1	942	51344	0.0099	0.5394
Aug.	2	1606	52950	0.0169	0.5563
Aug.	3	1416	54366	0.0149	0.5712
Aug.	4	1364	55730	0.0143	0.5855
Aug.	5	1322	57052	0.0139	0.5994
Aug.	6	1003	58055	0.0105	0.6099
Aug.	7	1526	59581	0.0160	0.6259
Aug.	8	1707	61288	0.0179	0.6439
Aug.	9	849	62137	0.0089	0.6528
Aug.	10	326	62463	0.0034	0.6562
Aug.	11	729	63192	0.0077	0.6639
Aug.	12	1238	64430	0.0130	0.6769
Aug.	13	616	65046	0.0065	0.6834
Aug.	14	673	65719	0.0071	0.6904
Aug.	15	1468	67187	0.0154	0.7059
Aug.	16	2341	69528	0.0246	0.7305
Aug.	17	4762	74290	0.0500	0.7805
Aug.	18	2168	76458	0.0228	0.8033
Aug.	19	2908	79366	0.0306	0.8338
Aug.	20	1682	81048	0.0177	0.8515

-Continued-

Appendix C.2 (page 2 of 2)

Date	Daily Count	Cumulative Count	Daily Proportion of Total	Cumulative Proportion of Total
Aug. 21	772	81820	0.0081	0.8596
Aug. 22	2345	84165	0.0246	0.8842
Aug. 23	1586	85751	0.0167	0.9009
Aug. 24	1482	87233	0.0156	0.9165
Aug. 25	721	87954	0.0076	0.9240
Aug. 26	224	88178	0.0024	0.9264
Aug. 27	309	88487	0.0032	0.9296
Aug. 28	665	89152	0.0070	0.9366
Aug. 29	1031	90183	0.0108	0.9474
Aug. 30	658	90841	0.0069	0.9544
Aug. 31	1107	91948	0.0116	0.9660
Sept. 1	848	92796	0.0089	0.9749
Sept. 2	316	93112	0.0033	0.9782
Sept. 3	304	93416	0.0032	0.9814
Sept. 4	174	93590	0.0018	0.9832
Sept. 5	511	94101	0.0054	0.9886
Sept. 6	286	94387	0.0030	0.9916
Sept. 7	104	94491	0.0011	0.9927
Sept. 8	145	94636	0.0015	0.9942
Sept. 9	201	94837	0.0021	0.9963
Sept. 10	0	94837	0.0000	0.9963
Sept. 11	0	94837	0.0000	0.9963
Sept. 12	2	94839	0.0000	0.9964
Sept. 13	60	94899	0.0006	0.9970
Sept. 14	14	94913	0.0001	0.9971
Sept. 15	17	94930	0.0002	0.9973
Sept. 16	14	94944	0.0001	0.9975
Sept. 17	28	94972	0.0003	0.9978
Sept. 18	35	95007	0.0004	0.9981
Sept. 19	49	95056	0.0005	0.9986
Sept. 20	29	95085	0.0003	0.9989
Sept. 21	23	95108	0.0002	0.9992
Sept. 22	30	95138	0.0003	0.9995
Sept. 23	13	95151	0.0001	0.9996
Sept. 24	4	95155	0.0000	0.9997
Sept. 25	9	95164	0.0001	0.9998
Sept. 26	4	95168	0.0000	0.9998
Sept. 27	5	95173	0.0001	0.9999
Sept. 28	5	95178	0.0001	0.9999
Sept. 29	3	95181	0.0000	1.0000
Sept. 30	2	95183	0.0000	1.0000
Oct. 1	0	95183	0.0000	1.0000
Oct. 2	0	95183	0.0000	1.0000
Oct. 3	0	95183	0.0000	1.0000
Oct. 4	0	95183	0.0000	1.0000
Oct. 5	0	95183	0.0000	1.0000
Oct. 6	0	95183	0.0000	1.0000
Oct. 7	0	95183	0.0000	1.0000
Oct. 8	1	95184	0.0000	1.0000
Oct. 9	0	95184	0.0000	1.0000
Oct. 10	0	95184	0.0000	1.0000
Oct. 11	0	95184	0.0000	1.0000
Oct. 12	0	95184	0.0000	1.0000
Oct. 13	0	95184	0.0000	1.0000
Oct. 14	0	95184	0.0000	1.0000
Oct. 15	0	95184	0.0000	1.0000
Oct. 16	0	95184	0.0000	1.0000
Oct. 17	0	95184	0.0000	1.0000
Oct. 18	1	95185	0.0000	1.0000

Mean Day of Migration = July 27 Variance = 550.1 Days squared

Appendix C.3. Age composition of sockeye salmon in the Chilkat Lake escapement by sex, age class, and escapement period, 1987.

	Brood Year and Age Class									
	1984	1983		1982		1981		1980		
	1.1	1.2	2.1	1.3	2.2	2.3	3.2	2.4	3.3	Total
Escapement Dates: (June 18 - July 11) Sample Dates: (July 4 - 8)										
Male										
Sample Number		4	2	33	2	5				46
Percent		4.6	2.3	37.9	2.3	5.7				52.9
Std. Error		2.2	1.6	5.2	1.6	2.5				5.3
Number		187	93	1542	93	233				2148
Female										
Sample Number		1		34	3	3				41
Percent		1.1		39.1	3.4	3.4				47.1
Std. Error		1.1		5.2	1.9	1.9				5.3
Number		47		1587	140	140				1914
All Fish										
Sample Number		5	2	67	5	8				87
Percent		5.7	2.3	77.0	5.7	9.2				100.0
Std. Error		2.5	1.6	4.5	2.5	3.1				
Number		234	93	3129	233	373				4062
Escapement Dates: (July 12 - 18) Sample Dates: (July 12 - 16)										
Male										
Sample Number	4	3	14	71	13	25				130
Percent	1.9	1.4	6.6	33.5	6.1	11.8				61.3
Std. Error	0.9	0.8	1.7	3.2	1.6	2.2				3.3
Number	106	79	370	1877	343	660				3435
Female										
Sample Number		1		54	6	21				82
Percent		0.5		25.5	2.8	9.9				38.7
Std. Error		0.5		2.9	1.1	2.0				3.3
Number		26		1426	159	555				2166
All Fish										
Sample Number	4	4	14	125	19	46				212
Percent	1.9	1.9	6.6	59.0	9.0	21.7				100.0
Std. Error	0.9	0.9	1.7	3.3	1.9	2.8				
Number	106	105	370	3303	502	1215				5601
Escapement Dates: (July 19 - 25) Sample Dates: (July 20 - 21)										
Male										
Sample Number	1	1	11	34	7	7				61
Percent	0.9	0.9	9.9	30.6	6.3	6.3				55.0
Std. Error	0.9	0.9	2.8	4.3	2.3	2.3				4.6
Number	23	23	252	779	160	160				1397
Female										
Sample Number				37	3	10				50
Percent				33.3	2.7	9.0				45.0
Std. Error				4.4	1.5	2.7				4.6
Number				847	69	229				1145
All Fish										
Sample Number	1	1	11	71	10	17				111
Percent	0.9	0.9	9.9	64.0	9.0	15.3				100.0
Std. Error	0.9	0.9	2.8	4.5	2.7	3.4				
Number	23	23	252	1626	229	389				2542
Escapement Dates: (July 26 - August 22) Sample Dates: (August 5 - 20)										
Male										
Sample Number	4	2	8	18	2	7				41
Percent	6.7	3.3	13.3	30.0	3.3	11.7				68.3
Std. Error	3.2	2.3	4.4	5.9	2.3	4.1				6.0
Number	252	126	503	1133	126	440				2580
Female										
Sample Number				6	6	7				19
Percent				10.0	10.0	11.7				31.7
Std. Error				3.9	3.9	4.1				6.0
Number				377	378	440				1195
All Fish										
Sample Number	4	2	8	24	8	14				60
Percent	6.7	3.3	13.3	40.0	13.3	23.3				100.0
Std. Error	3.2	2.3	4.4	6.3	4.4	5.5				
Number	252	126	503	1510	504	880				3775
e	127	63	253	-Continued- 760	254	443				1900
this period ℓ										1875
total early stock	256	425	968	8,818	1,218	2,420				14,105 ✓

Appendix C.3. (page 2 of 3)

	Brood Year and Age Class									
	1984	1983		1982		1981		1980		
	1.1	1.2	2.1	1.3	2.2	2.3	3.2	2.4	3.3	Total
Escapement Dates:	(August 23 - 29)									
Sample Dates:	(August 23 - 27)									
Male										
Sample Number	4	1	4	14	9	14				46
Percent	5.3	1.3	5.3	18.7	12.0	18.7				61.3
Std. Error	2.6	1.3	2.6	4.5	3.8	4.5				5.6
Number	330	83	330	1156	743	1156				3798
Female										
Sample Number		1		2	18	8				29
Percent		1.3		2.7	24.0	10.7				38.7
Std. Error		1.3		1.9	4.9	3.6				5.6
Number		83		165	1486	661				2395
All Fish										
Sample Number	4	2	4	16	27	22				75
Percent	5.3	2.7	5.3	21.3	36.0	29.3				100.0
Std. Error	2.6	1.9	2.6	4.7	5.5	5.3				
Number	330	166	330	1321	2229	1817				6193
Escapement Dates:	(August 30 - Sept. 5)									
Sample Dates:	(August 30 - Sept. 4)									
Male										
Sample Number		2	1	16	55	64				138
Percent		0.9	0.4	7.0	23.9	27.8				60.0
Std. Error		0.6	0.4	1.6	2.6	2.7				3.0
Number		14	7	113	387	450				971
Female										
Sample Number		1		7	49	35				92
Percent		0.4		3.0	21.3	15.2				40.0
Std. Error		0.4		1.1	2.5	2.2				3.0
Number		7		49	345	246				647
All Fish										
Sample Number		3	1	23	104	99				230
Percent		1.3	0.4	10.0	45.2	43.0				100.0
Std. Error		0.7	0.4	1.8	3.0	3.0				
Number		21	7	162	732	696				1618
Escapement Dates:	(Sept. 6 - 19)									
Sample Dates:	(Sept. 16 - 19)									
Male										
Sample Number		4		7	43	36		1		91
Percent		2.8		4.9	30.3	25.4		0.7		64.1
Std. Error		1.0		1.3	2.7	2.6		0.5		2.9
Number		8		14	87	73		2		184
Female										
Sample Number				13	21	17				51
Percent				9.2	14.8	12.0				35.9
Std. Error				1.7	2.1	1.9				2.9
Number				26	42	34				102
All Fish										
Sample Number		4		20	64	53		1		142
Percent		2.8		14.1	45.1	37.3		0.7		100.0
Std. Error		1.0		2.1	3.0	2.9		0.5		
Number		8		40	129	107		2		286
Escapement Dates:	(Sept. 20 - 26)									
Sample Dates:	(Sept. 20 - 26)									
Male										
Sample Number		2		3	57	64				126
Percent		0.8		1.2	23.0	25.8				50.8
Std. Error		0.6		0.7	2.7	2.8				3.2
Number		145		218	4145	4654				9162
Female										
Sample Number				5	75	38	4			122
Percent				2.0	30.2	15.3	1.6			49.2
Std. Error				0.9	2.9	2.3	0.8			3.2
Number				364	5453	2763	291			8871
All Fish										
Sample Number		2		8	132	102	4			248
Percent		0.8		3.2	53.2	41.1	1.6			100.0
Std. Error		0.6		1.1	3.2	3.1	0.8			
Number		145		582	9598	7417	291			18033

-Continued-

Appendix C.3. (page 3 of 3)

	Brood Year and Age Class									
	1984	1983		1982		1981		1980		
	1.1	1.2	2.1	1.3	2.2	2.3	3.2	2.4	3.3	Total
Escapement Dates:	(Sept. 27 - October 3)									
Sample Dates:	(Sept. 28 - 30)									
Male										
Sample Number		1			47	53			2	103
Percent		0.5			22.9	25.9			1.0	50.2
Std. Error		0.5			2.9	3.0			0.7	3.4
Number		30			1414	1594			60	3098
Female										
Sample Number		2		1	62	35	2			102
Percent		1.0		0.5	30.2	17.1	1.0			49.8
Std. Error		0.7		0.5	3.2	2.6	0.7			3.4
Number		60		30	1864	1053	60			3067
All Fish										
Sample Number		3		1	109	88	2		2	205
Percent		1.5		0.5	53.2	42.9	1.0		1.0	100.0
Std. Error		0.8		0.5	3.4	3.4	0.7		0.7	
Number		90		30	3278	2647	60		60	6165
Escapement Dates:	(October 4 - November 20)									
Sample Dates:	(October 17 - 20)									
Male										
Sample Number				2	12	39	1			54
Percent				2.2	13.2	42.9	1.1			59.3
Std. Error				1.3	3.0	4.4	0.9			4.4
Number				7	42	137	3			189
Female										
Sample Number		1		1	9	24	1		1	37
Percent		1.1		1.1	9.9	26.4	1.1		1.1	40.7
Std. Error		0.9		0.9	2.7	3.9	0.9		0.9	4.4
Number		3		3	31	86	3		3	129
All Fish										
Sample Number		1		3	21	63	2		1	91
Percent		1.1		3.3	23.1	69.2	2.2		1.1	100.0
Std. Error		0.9		1.6	3.8	4.1	1.3		0.9	
Number		3		10	73	223	6		3	318
Combined Periods (Percentages are weighted by period escapements)										
Male										
Sample Number	13	20	40	198	247	314	1	1	2	836
Percent	1.5	1.4	3.2	14.1	15.5	19.7	<0.1	<0.1	0.1	55.5
Std. Error	0.4	0.4	0.5	1.0	1.2	1.3	<0.1	<0.1	0.1	1.6
Number	711	695	1555	6839	7540	9557	3	2	60	26961
Female										
Sample Number		7		160	252	198	7		1	625
Percent		0.5		10.0	20.5	12.8	0.7		<0.1	44.5
Std. Error		0.2		0.8	1.4	1.1	0.3		<0.1	1.6
Number		226		4874	9967	6207	354		3	21632
All Fish										
Sample Number	13	27	40	358	499	512	8	1	3	1461
Percent	1.5	1.9	3.2	24.1	36.0	32.4	0.7	<0.1	0.1	100.0
Std. Error	0.4	0.4	0.5	1.1	1.5	1.5	0.3	<0.1	0.1	
Number	711	921	1555	11713	17507	15764	357	2	63	48593

Appendix C.4. Age composition of sockeye salmon in the Chilkoot Lake escapement by sex, age class, and escapement period, 1987.

	Brood Year and Age Class							
	1983	1982		1981		1980		
	1.2	1.3	2.2	1.4	2.3	2.4	3.3	Total
Escapement Dates:	(June 4 - 27)							
Sample Dates:	(June 11 - 27)							
Male								
Sample Number	17	241	6		13			277
Percent	3.6	51.3	1.3		2.8			58.9
Std. Error	0.9	2.3	0.5		0.7			2.2
Number	614	8700	217		469			10000
Female								
Sample Number	4	176	3	1	9			193
Percent	0.9	37.4	0.6	0.2	1.9			41.1
Std. Error	0.4	2.2	0.4	0.2	0.6			2.2
Number	144	6355	108	36	325			6968
All Fish								
Sample Number	21	417	9	1	22			470
Percent	4.5	88.7	1.9	0.2	4.7			100.0
Std. Error	0.9	1.4	0.6	0.2	1.0			
Number	758	15055	325	36	794			16968
Escapement Dates:	(June 28 - July 11)							
Sample Dates:	(June 28 - July 11)							
Male								
Sample Number	15	114	3		9			141
Percent	5.0	38.3	1.0		3.0			47.3
Std. Error	1.3	2.8	0.6		1.0			2.9
Number	516	3919	103		309			4847
Female								
Sample Number	5	144			8			157
Percent	1.7	48.3			2.7			52.7
Std. Error	0.7	2.9			0.9			2.9
Number	172	4950			275			5397
All Fish								
Sample Number	20	258	3		17			298
Percent	6.7	86.6	1.0		5.7			100.0
Std. Error	1.4	1.9	0.6		1.3			
Number	688	8869	103		584			10244
Escapement Dates:	(July 12 - 25)							
Sample Dates:	(July 12 - 25)							
Male								
Sample Number	37	149	6		17			209
Percent	9.9	39.8	1.6		4.5			55.9
Std. Error	1.5	2.5	0.6		1.1			2.5
Number	1497	6029	243		688			8457
Female								
Sample Number	10	133	2		20			165
Percent	2.7	35.6	0.5		5.3			44.1
Std. Error	0.8	2.4	0.4		1.2			2.5
Number	405	5382	81		809			6677
All Fish								
Sample Number	47	282	8		37			374
Percent	12.6	75.4	2.1		9.9			100.0
Std. Error	1.7	2.2	0.7		1.5			
Number	1902	11411	324		1497			15134

-Continued-

	Brood Year and Age Class							
	1983	1982		1981		1980		
	1.2	1.3	2.2	1.4	2.3	2.4	3.3	Total
Escapement Dates:	(July 27 - August 1)							
Sample Dates:	(July 27 - August 1)							
Male								
Sample Number	29	68	2		9			108
Percent	14.4	33.8	1.0		4.5			53.7
Std. Error	2.5	3.3	0.7		1.4			3.5
Number	1298	3044	90		403			4835
Female								
Sample Number	9	68	5		11			93
Percent	4.5	33.8	2.5		5.5			46.3
Std. Error	1.4	3.3	1.1		1.6			3.5
Number	403	3044	224		492			4163
All Fish								
Sample Number	38	136	7		20			201
Percent	18.9	67.7	3.5		10.0			100.0
Std. Error	2.7	3.3	1.3		2.1			
Number	1701	6088	314		895			8998
Escapement Dates:	(August 2 - 8)							
Sample Dates:	(August 2 - 8)							
Male								
Sample Number	19	76	6		19			120
Percent	8.5	33.9	2.7		8.5			53.6
Std. Error	1.8	3.1	1.1		1.8			3.3
Number	843	3374	267		843			5327
Female								
Sample Number	10	69	3		22			104
Percent	4.5	30.8	1.3		9.8			46.4
Std. Error	1.4	3.1	0.8		2.0			3.3
Number	444	3063	133		977			4617
All Fish								
Sample Number	29	145	9		41			224
Percent	12.9	64.7	4.0		18.3			100.0
Std. Error	2.2	3.2	1.3		2.6			
Number	1287	6437	400		1820			9944
Escapement Dates:	(August 9 - 15)							
Sample Dates:	(August 9 - 15)							
Male								
Sample Number	4	53	3	1	31	1		93
Percent	2.6	34.2	1.9	0.6	20.0	0.6		60.0
Std. Error	1.3	3.8	1.1	0.6	3.2	0.6		3.9
Number	152	2017	114	38	1180	38		3539
Female								
Sample Number	1	33	1		27			62
Percent	0.6	21.3	0.6		17.4			40.0
Std. Error	0.6	3.3	0.6		3.0			3.9
Number	38	1256	38		1028			2360
All Fish								
Sample Number	5	86	4	1	58	1		155
Percent	3.2	55.5	2.6	0.6	37.4	0.6		100.0
Std. Error	1.4	4.0	1.3	0.6	3.8	0.6		
Number	190	3273	152	38	2208	38		5899

-Continued-

Appendix C.4. (page 3 of 3)

	Brood Year and Age Class							
	1983	1982		1981		1980		
	1.2	1.3	2.2	1.4	2.3	2.4	3.3	Total
Escapement Dates:	(August 16 - 22)							
Sample Dates:	(August 16 - 22)							
Male								
Sample Number	19	75	6		103	1		204
Percent	5.7	22.4	1.8		30.7	0.3		60.9
Std. Error	1.3	2.3	0.7		2.5	0.3		2.6
Number	963	3801	304		5220	51		10339
Female								
Sample Number	2	67	1	1	59	1		131
Percent	0.6	20.0	0.3	0.3	17.6	0.3		39.1
Std. Error	0.4	2.2	0.3	0.3	2.1	0.3		2.6
Number	101	3396	51	51	2989	51		6639
All Fish								
Sample Number	21	142	7	1	162	2		335
Percent	6.3	42.4	2.1	0.3	48.4	0.6		100.0
Std. Error	1.3	2.7	0.8	0.3	2.7	0.4		
Number	1064	7197	355	51	8209	102		16978
Escapement Dates:	(August 23 - October 18)							
Sample Dates:	(August 23 - Sept. 9)							
Male								
Sample Number	3	37	1	1	39		1	82
Percent	2.0	24.7	0.7	0.7	26.0		0.7	54.7
Std. Error	1.1	3.5	0.7	0.7	3.6		0.7	4.1
Number	221	2718	73	73	2866		73	6024
Female								
Sample Number	1	24	1	1	41			68
Percent	0.7	16.0	0.7	0.7	27.3			45.3
Std. Error	0.7	3.0	0.7	0.7	3.6			4.1
Number	73	1763	73	73	3014			4996
All Fish								
Sample Number	4	61	2	2	80		1	150
Percent	2.7	40.7	1.3	1.3	53.3		0.7	100.0
Std. Error	1.3	4.0	0.9	0.9	4.1		0.7	
Number	294	4481	146	146	5880		73	11020
Combined Periods (Percentages are weighted by period escapements)								
Male								
Sample Number	143	813	33	2	240	2	1	1234
Percent	6.4	35.3	1.5	0.1	12.6	0.1	0.1	56.1
Std. Error	0.5	1.0	0.3	0.1	0.7	0.1	0.1	1.1
Number	6104	33602	1411	111	11978	89	73	53368
Female								
Sample Number	42	714	16	3	197	1		973
Percent	1.9	30.7	0.7	0.2	10.4	0.1		43.9
Std. Error	0.3	1.0	0.2	0.1	0.7	0.1		1.1
Number	1780	29209	708	160	9909	51		41817
All Fish								
Sample Number	185	1527	49	5	437	3	1	2207
Percent	8.3	66.0	2.2	0.3	23.0	0.1	0.1	100.0
Std. Error	0.6	1.0	0.3	0.1	0.9	0.1	0.1	
Number	7884	62811	2119	271	21887	140	73	95185

Appendix C.5. Age composition of sockeye salmon in the Lace River escapement by sex and age class, 1987.

	Brood Year and Age Class				
	1983		1982	1981	
	0.3	1.2	1.3	2.3	Total
Sample Date:	(August 15)				
Male					
Sample Number	30	3	57	1	91
Percent	22.6	2.3	42.9	0.8	68.4
Std. Error	3.6	1.3	4.3	0.8	4.0
Female					
Sample Number	13	3	26		42
Percent	9.8	2.3	19.5		31.6
Std. Error	2.6	1.3	3.5		4.0
All Fish					
Sample Number	43	6	83	1	133
Percent	32.3	4.5	62.4	0.8	100.0
Std. Error	4.1	1.8	4.2	0.8	

Appendix C.6. Age composition of sockeye salmon in the Chilkat River Mainstem escapement by sex and age class, 1987.

	Brood Year and Age Class					
	1984	1983		1982	1981	
	0.2	0.3	1.2	1.3	2.3	Total
Sample Date: (October 14)						
Male						
Sample Number	5	2	2	16	1	26
Percent	9.8	3.9	3.9	31.4	2.0	51.0
Std. Error	4.2	2.7	2.7	6.6	2.0	7.1
Female						
Sample Number		3		22		25
Percent		5.9		43.1		49.0
Std. Error		3.3		7.0		7.1
All Fish						
Sample Number	5	5	2	38	1	51
Percent	9.8	9.8	3.9	74.5	2.0	100.0
Std. Error	4.2	4.2	2.7	6.2	2.0	

Appendix C.7. Length composition of sockeye salmon in the Chilkat Lake escapement by sex, age class, and escapement period, 1987.

		Brood Year and Age Class								
		1984	1983		1982		1981		1980	
		1.1	1.2	2.1	1.3	2.2	2.3	3.2	2.4	3.3
Escapement Dates: (June 18 - July 11)										
Sample Dates: (July 4 - 8)										
Male	Avg. Length		495	350	592	530	553			
	Std. Error		27.5		6.2	40.0	14.1			
	Sample Size		4	2	33	2	5			
Female	Avg. Length		515		584	508	597			
	Std. Error				5.1	21.3	11.7			
	Sample Size		1		34	3	3			
All Fish	Avg. Length		499	350	588	517	569			
	Std. Error		21.6		4.0	18.0	12.2			
	Sample Size		5	2	67	5	8			
Escapement Dates: (July 12 - 18)										
Sample Dates: (July 12 - 16)										
Male	Avg. Length	340	440	342	600	513	563			
	Std. Error	6.1	16.1	2.5	3.6	15.1	8.2			
	Sample Size	4	3	14	71	13	25			
Female	Avg. Length		460		588	540	581			
	Std. Error				3.7	3.4	4.3			
	Sample Size		1		54	6	21			
All Fish	Avg. Length	340	445	342	594	522	571			
	Std. Error	6.1	12.4	2.5	2.6	10.7	5.0			
	Sample Size	4	4	14	125	19	46			
Escapement Dates: (July 19 - 25)										
Sample Dates: (July 20 - 21)										
Male	Avg. Length	335	480	343	609	511	572			
	Std. Error			4.4	4.4	12.9	12.3			
	Sample Size	1	1	11	34	7	7			
Female	Avg. Length				590	548	589			
	Std. Error				2.6	11.7	9.4			
	Sample Size				37	3	10			
All Fish	Avg. Length	335	480	343	599	523	582			
	Std. Error			4.4	2.7	10.9	7.5			
	Sample Size	1	1	11	71	10	17			
Escapement Dates: (July 26 - August 22)										
Sample Dates: (August 5 - 20)										
Male	Avg. Length	343	560	349	616	500	611			
	Std. Error	8.5	10.0	4.7	4.6	40.0	14.3			
	Sample Size	4	2	8	18	2	7			
Female	Avg. Length				604	537	579			
	Std. Error				6.9	11.2	11.7			
	Sample Size				6	6	7			
All Fish	Avg. Length	343	560	349	613	528	595			
	Std. Error	8.5	10.0	4.7	3.9	12.7	10.0			
	Sample Size	4	2	8	24	8	14			

-Continued-

		Brood Year and Age Class								
		1984	1983		1982		1981		1980	
		1.1	1.2	2.1	1.3	2.2	2.3	3.2	2.4	3.3
Escapement Dates: (August 23 - 29)										
Sample Dates: (August 23 - 27)										
Male	Avg. Length	333	550	360	615	524	621			
	Std. Error	8.5		7.1	4.9	20.6	3.8			
	Sample Size	4	1	4	14	9	14			
Female	Avg. Length		520		603	542	582			
	Std. Error				22.5	7.2	6.3			
	Sample Size		1		2	18	8			
All Fish	Avg. Length	333	535	360	614	536	607			
	Std. Error	8.5	15.0	7.1	4.9	8.3	5.2			
	Sample Size	4	2	4	16	27	22			
Escapement Dates: (August 30 - Sept. 5)										
Sample Dates: (August 30 - Sept. 4)										
Male	Avg. Length		525	580	613	528	607			
	Std. Error		30.0		7.3	5.9	4.4			
	Sample Size		2	1	16	55	64			
Female	Avg. Length		490		602	526	583			
	Std. Error				8.2	5.2	4.6			
	Sample Size		1		7	49	35			
All Fish	Avg. Length		513	580	610	527	598			
	Std. Error		20.9		5.7	4.0	3.5			
	Sample Size		3	1	23	104	99			
Escapement Dates: (Sept. 6 - 19)										
Sample Dates: (Sept. 16 - 19)										
Male	Avg. Length		525		608	542	604		565	
	Std. Error		19.0		13.7	5.8	5.7			
	Sample Size		4		7	43	36		1	
Female	Avg. Length				600	541	600			
	Std. Error				5.0	5.6	6.1			
	Sample Size				13	21	17			
All Fish	Avg. Length		525		603	542	603		565	
	Std. Error		19.0		5.6	4.3	4.3			
	Sample Size		4		20	64	53		1	
Escapement Dates: (Sept. 20 - 26)										
Sample Dates: (Sept. 20 - 26)										
Male	Avg. Length		548		610	547	612			
	Std. Error		12.5		7.6	3.7	4.5			
	Sample Size		2		3	57	64			
Female	Avg. Length				602	530	591	521		
	Std. Error				7.2	2.7	3.5	6.6		
	Sample Size				5	75	38	4		
All Fish	Avg. Length		548		605	537	604	521		
	Std. Error		12.5		5.2	2.3	3.3	6.6		
	Sample Size		2		8	132	102	4		

-Continued-

Appendix C.7. (page 3 of 3)

		Brood Year and Age Class								
		1984	1983		1982		1981		1980	
		1.1	1.2	2.1	1.3	2.2	2.3	3.2	2.4	3.3
Escapement Dates: (Sept. 27 - October 3)										
Sample Dates: (Sept. 28 - 30)										
Male	Avg. Length		435			552	618			585
	Std. Error					5.9	3.8			15.0
	Sample Size		1			47	53			2
Female	Avg. Length		548		600	524	587	560		
	Std. Error		17.5			3.6	4.7			
	Sample Size		2		1	62	35	2		
All Fish	Avg. Length		510		600	536	606	560		585
	Std. Error		38.8			3.5	3.4			15.0
	Sample Size		3		1	109	88	2		2
Escapement Dates: (October 4 - November 20)										
Sample Dates: (October 17 - 20)										
Male	Avg. Length				618	541	619	470		
	Std. Error				17.5	6.1	3.9			
	Sample Size				2	12	39	1		
Female	Avg. Length		520		595	544	599	535		680
	Std. Error					8.6	5.9			
	Sample Size		1		1	9	24	1		1
All Fish	Avg. Length		520		610	543	611	503		680
	Std. Error				12.6	4.9	3.5	32.5		
	Sample Size		1		3	21	63	2		1
Combined Periods (Unweighted)										
Male	Avg. Length	338	507	352	604	538	606	470	565	585
	Std. Error	3.9	11.5	6.2	2.1	2.6	2.1			15.0
	Sample Size	13	20	40	198	247	314	1	1	2
Female	Avg. Length		514		590	530	589	534		680
	Std. Error		12.4		1.9	1.8	1.8	7.7		
	Sample Size		7		160	252	198	7		1
All Fish	Avg. Length	338	509	352	598	534	600	526	565	617
	Std. Error	3.9	9.0	6.2	1.5	1.6	1.5	10.5		32.8
	Sample Size	13	27	40	358	499	512	8	1	3

Appendix C.8. Length composition of sockeye salmon in the Chilkoot Lake escapement by sex, age class, and escapement period, 1987.

		Brood Year and Age Class						
		1983	1982		1981		1980	
		1.2	1.3	2.2	1.4	2.3	2.4	3.3
Escapement Dates: (June 4 - 27)								
Sample Dates: (June 11 - 27)								
Male	Avg. Length	464	582	465		563		
	Std. Error	10.8	2.3	18.1		11.8		
	Sample Size	17	241	6		13		
Female	Avg. Length	478	574	485	535	584		
	Std. Error	15.1	1.8	5.0		4.4		
	Sample Size	4	176	3	1	9		
All Fish	Avg. Length	466	579	472	535	571		
	Std. Error	9.1	1.6	12.2		7.5		
	Sample Size	21	417	9	1	22		
Escapement Dates: (June 28 - July 11)								
Sample Dates: (June 28 - July 11)								
Male	Avg. Length	460	594	438		598		
	Std. Error	7.1	2.3	19.2		8.0		
	Sample Size	15	114	3		9		
Female	Avg. Length	457	576			551		
	Std. Error	22.9	2.0			12.3		
	Sample Size	5	144			8		
All Fish	Avg. Length	459	584	438		576		
	Std. Error	7.4	1.6	19.2		9.1		
	Sample Size	20	258	3		17		
Escapement Dates: (July 12 - 26)								
Sample Dates: (July 12 - 26)								
Male	Avg. Length	467	592	449		593		
	Std. Error	5.9	2.0	13.4		5.8		
	Sample Size	37	149	6		17		
Female	Avg. Length	447	577	453		569		
	Std. Error	19.6	1.7	32.5		4.8		
	Sample Size	10	133	2		20		
All Fish	Avg. Length	463	585	450		580		
	Std. Error	6.2	1.4	11.6		4.2		
	Sample Size	47	282	8		37		

-Continued-

		Brood Year and Age Class						
		1983	1982		1981		1980	
		1.2	1.3	2.2	1.4	2.3	2.4	3.3
Escapement Dates: (July 27 - August 1)								
Sample Dates: (July 27 - August 1)								
Male	Avg. Length	473	596	495		581		
	Std. Error	6.4	2.4	10.0		7.7		
	Sample Size	29	68	2		9		
Female	Avg. Length	480	578	485		552		
	Std. Error	11.4	2.5	10.8		12.3		
	Sample Size	9	68	5		11		
All Fish	Avg. Length	475	587	488		565		
	Std. Error	5.5	1.9	8.0		8.1		
	Sample Size	38	136	7		20		
Escapement Dates: (August 2 - 8)								
Sample Dates: (August 2 - 8)								
Male	Avg. Length	457	590	468		596		
	Std. Error	7.1	3.3	12.4		4.6		
	Sample Size	19	76	6		19		
Female	Avg. Length	482	579	517		571		
	Std. Error	9.6	3.1	33.8		8.0		
	Sample Size	10	69	3		22		
All Fish	Avg. Length	466	584	484		582		
	Std. Error	6.0	2.3	15.1		5.2		
	Sample Size	29	145	9		41		
Escapement Dates: (August 9 - 15)								
Sample Dates: (August 9 - 15)								
Male	Avg. Length	518	596	482	630	599	610	
	Std. Error	19.8	2.6	7.3		3.4		
	Sample Size	4	53	3	1	31	1	
Female	Avg. Length	400	579	480		577		
	Std. Error		5.2			4.5		
	Sample Size	1	33	1		27		
All Fish	Avg. Length	494	589	481	630	589	610	
	Std. Error	28.1	2.7	5.2		3.1		
	Sample Size	5	86	4	1	58	1	

-Continued-

		Brood Year and Age Class						
		1983	1982		1981		1980	
		1.2	1.3	2.2	1.4	2.3	2.4	3.3
Escapement Dates: (August 16 - 22)								
Sample Dates: (August 16 - 22)								
Male	Avg. Length	485	594	462		591	590	
	Std. Error	10.3	2.6	8.6		1.9		
	Sample Size	19	75	6		103	1	
Female	Avg. Length	460	577	485	560	581	590	
	Std. Error	20.0	4.1			3.2		
	Sample Size	2	67	1	1	59	1	
All Fish	Avg. Length	483	586	465	560	587	590	
	Std. Error	9.5	2.5	8.0		1.7		
	Sample Size	21	142	7	1	162	2	
Escapement Dates: (August 23 - October 18)								
Sample Dates: (August 23 - Sept. 9)								
Male	Avg. Length	457	592	540	640	589		560
	Std. Error	18.6	4.7			3.5		
	Sample Size	3	37	1	1	39		1
Female	Avg. Length	470	574	500	600	568		
	Std. Error		4.5			3.8		
	Sample Size	1	24	1	1	41		
All Fish	Avg. Length	460	585	520	620	579		560
	Std. Error	13.5	3.5	20.0	20.0	2.8		
	Sample Size	4	61	2	2	80		1
Combined Periods (Unweighted)								
Male	Avg. Length	469	590	465	635	591	600	560
	Std. Error	3.1	1.0	5.9	5.0	1.5	10.0	
	Sample Size	143	813	33	2	240	2	1
Female	Avg. Length	466	576	488	565	573	590	
	Std. Error	6.8	0.9	8.4	18.9	2.0		
	Sample Size	42	714	16	3	197	1	
All Fish	Avg. Length	469	583	472	593	583	597	560
	Std. Error	2.9	0.7	5.0	20.1	1.3	6.7	
	Sample Size	185	1527	49	5	437	3	1

The Alaska Department of Fish and Game operates all of its public programs and activities free from discrimination on the basis of race, religion, color, national origin, sex, or handicap. Because the Alaska Department of Fish and Game receives federal funding, any person who believes he or she has been discriminated against should write to:

O.E.O.
U.S. Department of the Interior
Washington, D.C. 20240